

EN -G IN EER I NG

Academic Year 2020

4 YEAR BACHELOR OF ENGINEERING (B.E)

Computer Science | Civil

Electronics & Communication | Electrical

Electronics & Computer Science | Mechanical

BCA | MCA

CHITKARA
UNIVERSITY



Coliseum
THEATRE

BIDDING THE

OPPORTUNITIES AREN'T GIVEN
THEY'RE MADE.



CHITKARA MADE

ENGINEERING EDUCATION AHEAD OF ITS TIME

ENGINEERING PROGRAMS @ CHITKARA UNIVERSITY

At Chitkara University, our Engineering students receive great education that prepares them to advance the frontiers of technology.

Through our “Hands-on” curriculum, students design and construct all-terrain vehicles; design, build & load steel bridges; produce computer animations & video games; and harness the power of the sun to race cars that they design, build and test.

Our Engineering Graduates don't just learn theory – they expand upon it and apply it.

WELCOME TO CHITKARA UNIVERSITY PUNJAB

Chitkara Educational Trust established its Punjab campus in the year 2002 on Chandigarh-Patiala national highway which is 30km from Chandigarh. In the year 2010, Chitkara University was established by the Punjab State Legislature under "The Chitkara University Act".

Chitkara University is a government recognised University with the right to confer degrees as per the Sections 2(f) and 22(1) of the UGC Act. 1956. Chitkara University, Punjab, is a multi-discipline student centric campus with more than 10,000 students.

Small World

Whether you are a Bachelor's student, Master student or taking part in one of our Exchange Programs, we make sure you feel right at home with us. Chitkara University provides a specially safe and serene setting for studies. Students get to enjoy the changing seasons and are able to grow personally as well as professionally.

At Chitkara University, Education is not only "State-of-the-art" but truly "State-of-the-heart". Everything we do shares the same mind set.

We are passionate about what we do and we hope you will become a part of our family.

Cleared for launch

Any good roadmap to success requires that you know where you are going – and also where you have been. The third element is momentum.

In accordance with Chitkara University strategy, we allocate more and more resources to excellence in teaching and learning.

Our approach at Chitkara University is learning-centric, enhancing knowledge, skills and understanding through practical exposure.

Today, we have impressive world-wide collaboration agreements with top International Universities and research institutions which is helping us train Chitkara University students for the new global economy.

We strongly believe that we are creating the right kind of future for the professionals of tomorrow who we are educating today.

Industry-led Courses

Chitkara University offers a learning experience that improves your employment prospects. We maintain close links with leading blue-chip companies and professional associations to deliver most of our academic programs. Through these alliances we stay in touch with industry, ensuring that our courses are relevant, practical and deliver the skills in demand allowing our graduates to hit the ground running.

Strong corporate relationships also have a direct influence on our degree programs and have resulted in our "industry facing" curricula. This ensures that our education is up to date and valued by the future employers of our alumni.

Great Campus Recruitment

Chitkara University has established an unassailable reputation for strong campus recruitment on the sheer virtue of our intensive focus on making all our graduates "industry ready".

Start Me Up

The possibility to combine business and technology in their studies gives our students unique opportunities to build their future careers, be it through top-class companies or capitalising on their own innovations in order to create new businesses.

Think of it as your own, personal launch pad.

The UNIVERSITY
with one of the
highest number
of **PATENTS**
in the country

- 250+ Patents
- Joint research projects with Global Universities
- One of the largest University grants' recipient for the European Commission Erasmus+ Programme



the
largest
incubator
in North India
with more
than
100+
start-ups



**HIGHLY
RATED
FOR OUR
WORLD-CLASS,
FACILITIES
TEACHING &
RESEARCH**



Ranked as
one of the
Cleanest
Universities
of India in the
'SWACHHTA'
ranking





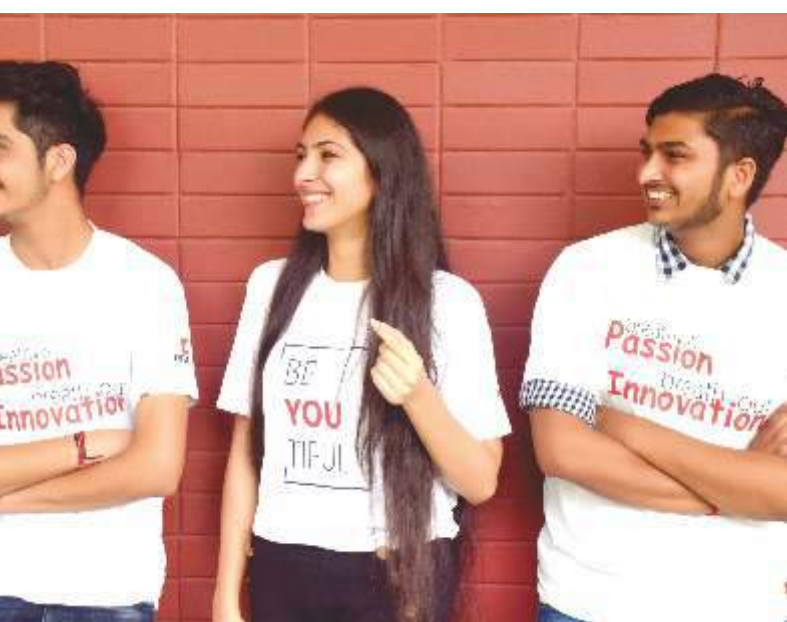
WELCOME TO **CHITKARA UNIVERSITY** **HIMACHAL PRADESH**

Chitkara University was established in the year 2008 by the Himachal Pradesh State Legislature under the "Chitkara University Act". Chitkara University is a government recognised University with the right to confer degrees as per the Sections 2f and 22(1) of the UGC Act, 1956 and is included in the list of universities maintained by the University Grants Commission.

Our 17 acres campus located at Atal Shiksha Kunj in Barotiwala is 32km from Chandigarh and 12km from Pinjore. It currently has more than 4000 full time students and over 300 faculty.

**FOR THE ACADEMIC YEAR 2020, CHITKARA UNIVERSITY IN HIMACHAL PRADESH
IS OFFERING ACADEMIC PROGRAMS IN THE FIELDS OF**

**ENGINEERING | INFORMATION TECHNOLOGY
BUSINESS | NURSING | PHARMACY | HOSPITALITY**





THE CITY BEAUTIFUL CHANDIGARH

A million people; infinite possibilities







COUNTED AMONG THE BEST



Chitkara University has once again been ranked among the Nation's Best in the 2019 NIRF Ranking

DATAQUEST

Data Quest has awarded Chitkara University as 'Outstanding University with Highest Campus Recruitment 2019'

OUTLOOK
THE WEEKLY NEWSMAGAZINE

Outlook-ICARE India Rankings 2019 ranked Chitkara University highly among the Top 50 Private State Universities list

THEWEEK

The Week-Hansa Research Survey 2019 ranked Chitkara University 6th among 'Non-Government Multi-Disciplinary Universities in North Zone'

**INDIA
TODAY**

India Today has consistently ranked Chitkara University among the 'Best in the Country'

CAREERS360

Careers360 has counted Chitkara University as one of the 'Best in the North Region'





CHITKARA ENGINEERING EDUCATION

Creating, inventing, innovating, attacking challenges, solving problems, improving the quality of life - these are the driving forces for an Engineer. And this ingenuity is a driving force of our society. From space stations to microsystems, the potential for innovative Engineering is endless. If you're wondering what the future might look like, Chitkara Engineering programs can show you the way.

Chitkara Engineering programs were initiated in the year 2002 with the sole focus to prepare students from all backgrounds for careers as Engineers in a rapidly changing, technology-driven society. **Within a decade, our Engineering programs have emerged among the top 50 of the country which speaks volumes about our strong academic heritage, innovative teaching methodology and proactive industry collaborations.**

Our courses enable you to develop your Engineering knowledge, skills, imagination and experience to the highest levels in readiness for your future career.

The Engineering programs at Chitkara University combine classroom and laboratory learning in technical areas with a broad liberal arts curriculum and industry assignments to give you an Education tuned to the 21st Century wavelength.

HIGHLY RANKED ENGINEERING PROGRAMS

Engineering Programs at Chitkara University have been consistently rated as one of the finest in the country which provides an insight into our unique blend of distinguished faculty and brilliant & intellectual students with proactive industry collaborations.



Ministry of Human Resource Development
Government of India

Chitkara University has once again been ranked among the Nation's Best in the 2019 NIRF Ranking



Chitkara University rated in 'Top 50' of 2019's annual BW Businessworld Engineering Rankings



India Today has consistently ranked Chitkara Engineering programs among the best in the country



Chitkara Engineering was placed as one of the top Engineering programs of the country in the WEEK-HANSA survey



Data Quest Magazine awarded Outstanding Engineering University of the year 2018 for placements.



Chitkara University Engineering programs Rated 'AAA+' by Careers360



Chronicle Magazine places Chitkara Engineering among 'India's Top 75 Best Engineering Colleges - 2019'



Education World Magazine ranked us as one of the 'Best in Punjab State' in EW India Private Institutes Rankings




Digital Learning Magazine rated as AAAAA in the Technical Education category in the country



CSR-GHRDC Engineering ranked Chitkara University as one of the 'Eminent Top Engineering Colleges'





**EMBARK ON
RESEARCH
FROM DAY ONE**

**SMALLER
CLASSES
FOR BETTER
LEARNING**

**GREAT
PLACEMENTS
GIVE YOUR
FUTURE A
BOOST**



**GREAT
TO JOIN
ENGINEERING**



**INTENSIVE FOCUS
ON BUILDING STRONG
COMMUNICATION
SKILLS**

**BRING
OUT THE
CREATOR AND
STRATEGIST
IN YOU**

**EMPOWER
YOU TO BUILD
A BETTER
WORLD WITH
AN INDUSTRY
BASED
EDUCATION**

REASONS CHITKARA PROGRAMS

VIBRANT STUDENT LIFE

- DEDICATED TIME TO PURSUE YOUR INTERESTS
- START SOMETHING YOU ARE PASSIONATE ABOUT

**COLLABORATION
WITH GLOBAL
UNIVERSITIES
TO BRING YOU A
WORLD-CLASS
EDUCATION**

TECHNICAL STUDENT CHAPTERS

At Chitkara University, we complement the Engineering programs by providing a variety of activities, educational opportunities, programs, facilities, and services that enhance student development and enrich the quality of campus life for our Engineering graduates.

With more than 20 active clubs and leadership positions in various student events, there are many other ways to refine your leadership and organisational management experience, explore interests, and make friendships that will last a lifetime.



The Institution of
Engineering and
Technology



Association for
Computer
Machinery



Society of
Automotive
Engineers



Institute of
Electronics and
Telecommunication
Engineers



Institute of
Electrical
Electronics
Engineers



The Indian
Society for
Technical
Education



Computer
Society of
India



American Society
of Mechanical
Engineers



The Institution
of Engineers

STRONG INDUSTRY COLLABORATIONS

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.

500+ campus recruiters
for batch of **1500**
Engineering Graduates

50+ Super Dream
Offers of
10 lakh+

121+
Companies Visiting
IITs / NITs also
Hired from our Campus

Highest Salary
offered by
AMAZON **31 lakh**

384
Dream Offers of
8 lakh

Students
Recruited by
INFOSYS
WIPRO
CAPGEMINI
On Day 1 **100+**

OVERVIEW OF CAMPUS RECRUITMENT FOR OUR ENGINEERING PROGRAMS

Our Engineering graduates go on to great careers, we're hands on and responsive in our teaching, we provide a great environment to study and our research is world class. We have established an unassailable reputation for very strong on-campus recruitments on the sheer virtue of our intensive focus on making all our graduates "industry ready", but brilliant campus recruitment is a end result of our teaching approach which is learning-centric enhancing knowledge, skills, and understanding through practical experience.

19th batch of Engineering graduates from Chitkara University, Punjab & 11th batch of Engineering graduates from Chitkara University, Himachal Pradesh appeared for the campus recruitment process this year.

Some of the major highlights of the campus recruitment for the batch graduating in the year 2019 were

- **500+ companies** came on-campus for hiring Chitkara Engineering students (Most of the companies are listed on the next page)
- Out of batch of 1500 around **534 students** got "**Dream Job Offers**" from marquee companies such as **Amazon, HP Labs, Verizon, FICO, Evalueserve, MakeMyTrip, Reliance Industries, HP & Quick Heal.**
- **100+ offers** given by StartUp unicorns **Byju's / OYO / Zomato / swiggy / PlaySimple / GoJek / HyperDart GreyOrange / Quickr / PolicyBazaar.**
- Some of the top on-campus recruiters were as follows -
Infosys / Wipro / Capgemini / Mindtree / Cybage / ITC Infotech / iNautix / Hitachi / Newgen Unisys / Virtusa / Sears Holding / GeekyAnts / TechMahindra / NIIT / Mountblue / EXL Services / HighRadius.
- For Mechanical Engineering students, some of the major companies that visit our campus are -
Reliance / Mahindra & Mahindra / Hyundai / Honda / Eaton/ SML ISUZU/ Yamaha/ L& T / Escorts / Jindal Saw Mondelez / Godrej & Boyce / Coca Cola / Panasonic / Piaggio / Hyundai Infrastructures / JCB India / Renault Nissan
- For Civil Engineering students, some of the major companies which visit our campus are -
L&T Construction / Sobha Developers / 3 C / Shapoorji Pallonji / Sterling & Wilson / Cinda Construction / Lafarge / Afcons / DLF / Raheja Construction / JSW Steel / Mahindra EPC

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

IT INDUSTRY

 Microsoft				
				
				
				
				
				
				
				
				
				

 Cybage® Delivering Value Scientifically	 BYJU'S THE LEARNING APP	 HLS ASIA LIMITED	 optmyze	 aayuja
 WINSHUTTLE	 JKT A Global IT Solutions, Consulting and Services Company	 uTrade Enabling Smarter Trading	 UNISYS	 ITCONSULTANTS Empowering Small Business with IT Solutions
 jade GLOBAL	 INTERGLOBE TECHNOLOGIES	 ZenSar TECHNOLOGIES Your Transformation Partner	 FLEXTRONICS X	 tbs
 edifecs	 TRIGENT OVERCOMING LIMITS	 KEWILL	 Infotech Creating Business Impact	 bitwise
 ESS EASTERN SOFTWARE SYSTEMS	 vodafone	 InfrasoftTech	 Birla soft®	 steria
 NIIT	 Hitachi Consulting	 ZYCUS	 TOSHIBA Leading Innovation >>>	 VIDEOCON
 tavisca®	 SPAN Steering Progress. Together.	 PAXCEL A Passion for Excellence	 SMARTDATA TECHNOLOGIES	 SafeNet
 MICROLAND®	 ERICSSON	 NEC	 Capgemini ENERGETIC TECHNOLOGY OUTLOOKING	 eClerx
 nagarro	 AGC	 AON	 BARCLAYS	 zscaler™
 aptean	 CORIOLIS	 cleartrip	 hyperDart	 MetricStream
 ZopSmart	 GOJEK An Ojek For Every Need	 affordplan	 SHOPCLUES.COM	 Mindtree Welcome to possible

HEAVY ENGINEERING /AUTOMOBILE / CONSTRUCTION

 Mahindra	 L&T Construction	 ESCORTS	DENSO	
	 A VOLVO GROUP AND EICHER MOTORS JOINT VENTURE	apollo	 KEC INTERNATIONAL LIMITED	
		 TATA TECHNOLOGIES	 JSW Steel	 ASHOK LEYLAND
Panasonic	 Reliance Industries Limited	B/S/H/ BOSCH SIEMENS BSH	 Mondelēz International	 HYUNDAI ENGINEERING & CONSTRUCTION
 Asahi India Glass Ltd.		 Hero	 LUMINOUS Engineering & Technology Services	 Ingersoll Rand Inspiring Progress™
 JK TYRE & INDUSTRIES LTD.	 SML ISUZU		 Punj Llyod	 SDNALIKA INTERNATIONAL ISO 9001:2000 COMPANY
 LG	 EVEREST Complete Building Solutions	 CINDA Engineering & Construction Services	 THE 3C COMPANY CREATE CARE CONSERVE	 AFCONS AFCONS INFRASTRUCTURE LIMITED A Shapoorji Pallonji Group Company
 Johnson Controls	 LAVA	 talbros QH Talbros Ltd.	 Cummins	 Gestamp
 ROYAL ENFIELD	 SKODA	 HONDA	 RASCO	 PIAGGIO
 Shapoorji Pallonji	 LAFARGE Building Better World™	 DLF BUILDING INDIA	 RAHEJA DEVELOPERS	 GAR GAR Infrastructure
 CHC CONSULTING ASIA-PACIFIC PVT. LTD. A Subsidiary of CHC CONSULTING, LLC	 Abellon CleanEnergy	 AMARA RAJA GUTTA KE A BETTER WAY	 SECURE	 Steel Strips Wheels Limited

HEAVY ENGINEERING /AUTOMOBILE / CONSTRUCTION

SEMI CONDUCTORS / KPO / CONSULTING

CHITKARA UNIVERSITY WILL EMBARK ON LET YOU RESEARCH FROM DAY ONE

RESEARCH OPPORTUNITIES ARE OPEN TO 100% OF CHITKARA ENGINEERING STUDENTS.

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

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

Through **Chitkara University Research and Innovation Network (CURIN)**, our researchers, staff and students work across disciplines to extend the boundaries of knowledge. 12 Centres of advanced research under CURIN build and sustain Chitkara University's competitive advantage through leadership. These centers and institutes are the locus of research for collaborative groups of investigators pushing the frontiers of knowledge forward. They are involved in cutting edge research, exploring new technologies to improve the country's infrastructure and safety — and contributing to society through many other discoveries and innovations.



THE UNIVERSITY WITH ONE OF THE HIGHEST NUMBER OF PATENTS IN THE COUNTRY*



INTELLECTUAL
PROPERTY **INDIA**

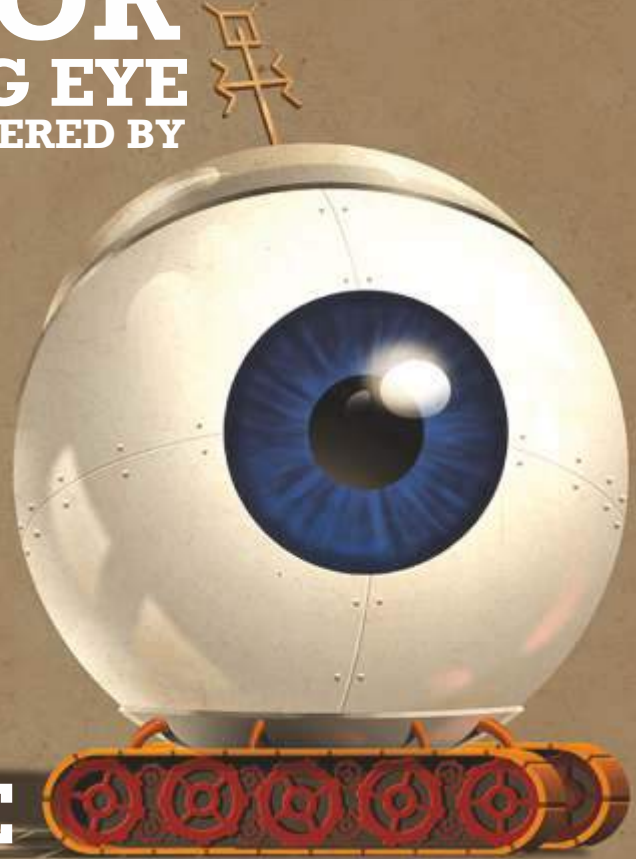
Year after year, Chitkara University has been ranked among the Top 10 Universities of the country for filing maximum patents which speaks volumes about our research team, state-of-the-art infrastructure and intensive focus on working with new ideas and technologies.

- 250+ Patents
- 12 Centres of Excellence
- 10 Crore+ Research Grants
- Joint research projects with Global Universities
- One of the largest University grants' recipient for the European

* According to 2 years ranking by the Office of the Controller General of Patents, Designs, Trade Marks and Geographical Indications, India

THE FIRST EVER **SENSOR**
DRIVEN WALKING EYE
FOR THE BLIND WAS DISCOVERED BY
OUR STUDENTS.

**RESEARCH &
PRACTICE
LED CULTURE**





Traffic signals in Mohali to go smart, intelligent

First 3-D Smart Traffic Signal Starts Working

TIMES NEWS NETWORK

Mohali: The traffic police in Mohali on Friday launched the country's first 3-D Smart Traffic Signal system operating in Mohali on pilot project basis. The system will regulate the traffic signals with a smart bird's eye view wireless sensor system.

The system was launched by additional director general of police (ADGP) Traffic Shrad Satya Chauhan. He said this will be first-ever system that would also defend the green corridors for ambulances while controlling the traffic movement. The system has been launched at the traffic crossing near Quark City on Airport Road.

The Punjab Police have adopted the system devised by the students of Chitkara University over three years of research



Punjab Police have adopted the system devised by students of Chitkara University over three years of research

arch and had been on test for the last eight months. A team comprising Gaurav of Anukai Solutions, Navdeep Asija, Punjab traffic advisor, Arbab Ahmad, project manager, Punjab Vision Zero and Charanjit Singh, road safety engineer, Mohali worked to develop the real-time solution.

The new system will function as per the availability of traffic on each side of the road. The pilot project has been selected for the trial run and will

be duplicated in other places soon, said ADGP Chauhan.

ADGP Chauhan said, it is the country's first 3-D Smart Traffic Signal system. Traditional methods of traffic police controlling and regulating traffic are much labour-intensive and 2-dimensional. Employing the 3-D technique to make traffic signal fully actuated and on a real-time basis is first of its kind in the country. It will regulate the traffic movement based on the gravity of traffic

approaching the signals through self-sensing technique. This system will also support the green corridor concept by sensing the arrival of ambulances and fire tenders.

A memorandum of understanding to conduct research and development in the area of IT and computation for traffic police with the start-up Anukai Solutions of Chitkara University was signed in the month of September 2018 and immediately after that team was assigned to this task, he added.

The actuated signals incur high initial and on-going maintenance costs than fixed time signals, varying from Rs 70 lakh to Rs 1 crore. This simple mechanism will just cost 1% of the fixed signal cost and will start working as a fully actuated signal. It not only huge saving in costs, but this will also reduce the tendency of drivers to jump traffic light and reduce travel time by cutting the time spent at traffic signal. Each second saved at the traffic signal is saving in litres of fuel and emissions. This system costs just Rs 50,000, said state traffic advisor Navdeep Asija.

EXPLORE.
DREAM.
DISCOVER.



Student invents single-use plastic substitute

Barinderjit. Saluja
@timesgroup.com

Mohali: Amid the dire need to come up with a substitute for single-use plastic products, a BTech student of Chitkara University, Baddi campus, has invented a product which he claims can serve the purpose. As per the invention, starch extracted from potato waste is used to make pellets which can be further used to manufacture items like straw, spoons, forks, plates, carry bags and water bottles.

A second year BTech student **Pranav Goyal**, along with his mentor **Abha Sharma**, assistant professor at Chitkara University, brought the prototype of his invention, showcasing the material which can be moulded into a spoon or a fork or party plate. He claimed that it is purely biodegradable and environ-



ment friendly.

Pranav said, 'We use starch extracted from potato waste centrifuging it to form another material which can be used as raw material in place of plastic products to manufacture carry bags, water bottles, spoons, straws, forks, plates and glasses. It is 100% biodegradable product and environment friendly. We make pellets of the starch to feed it into extruder to mould it into different shapes of products replacing the plastic pro-

ducts. With this, we give an alternative for single-use plastic products which has been banned by government recently.'

Pranav said his elder sister **Saloni Goyal** owns a bioplastic manufacturing company and is a co-founder of the same. The invention has been developed under the company **SPM Bioplastic**, which is incubated at Explore Hub, Chitkara University, Himachal Pradesh, said Abha.

Chitkara University Centre for Entrepreneurship Education & Development (CEED) encourages and motivates students to be part of start-up ecosystem which is headed by director **Sumeer Walia**.

The aim is to replace the petroleum-based plastic products which is one of the major causes of polluting the environment.







The Global Engineering

Live independently. Gain cultural awareness. Expand your social network to span the globe. Make new friends who may become your future business collaborators in an increasingly interconnected world.

Learn in a classroom on a different continent. Experience working in the real world, around the world. Lend a hand to those in need. There are so many new experiences awaiting you at Chitkara University.

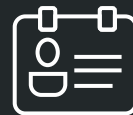
For the year 2018-19, Chitkara University had Global Mobility of more than 200+ Chitkara Engineering graduates to over 50 Universities on internships, summer school and semester exchange.

GLOBAL MOBILITY OF OUR ENGINEERING GRADUATES

Our Engineering graduates have the option to study the first 2 years of Engineering programs at Chitkara University campus and then complete their Degree at a partner global University.

Chitkara University offers study abroad programs in over 35 countries and there's something for every Engineering aspirant.

Deakin University
Western Sydney University
Federation University
Griffith University
Murdoch University
BCIT
Vancouver Island University
University of Prince Edward Island
York University
George Brown College
Georgian College
Missouri University of Science & Technology
Southern Illinois University Edwardsville
California State University, San Marcos
University of California Riverside - Extension
University of Wisconsin - Parkside
Kent State University
University of Birmingham
Heriot Watt University
Glasgow Caledonian University
Nottingham Trent University
Anglia Ruskin University
Heriot Watt University
University of Birmingham
Murdoch University



Global internships and work-integrated learning



Trimester, winter and summer exchange



Overseas short courses



International Volunteering



Academic study tours and field trips



Research Practicums



Overseas conferences and workshops



CHITKARA INNOVATION INCUBATOR



Chitkara Innovation Incubator is one of the largest Government supported incubators in North India with more than 100+ student start-ups. It is designed to provide aspiring student entrepreneurs with the education, resources and funding to start and expand their businesses.

SUPPORTED BY



Department of Science and Technology
Ministry of Science and Technology
Government of India



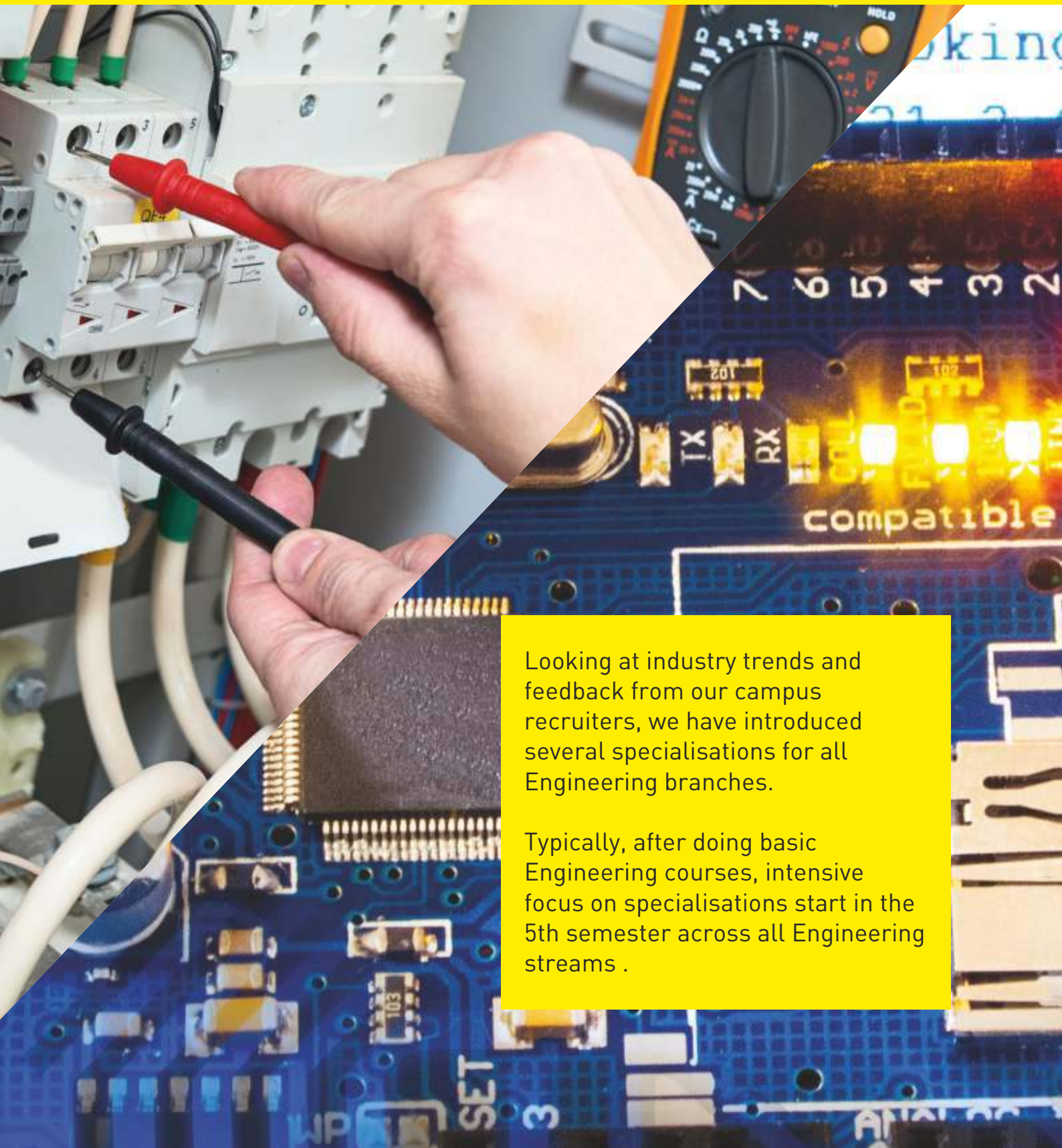


The largest Campus based incubator in North India

- 30,000 sq. ft. Incubators in Chandigarh /Punjab Campus/ Himachal Campus
- 500+ Entrepreneurs mentored
- Earn while you learn program with these startups
- Entrepreneurship as a specialisation track
- Intensive focus on students led start-ups in campus



YOU CAN CHOOSE SPECIALISATIONS AFTER 4TH SEMESTER



Looking at industry trends and feedback from our campus recruiters, we have introduced several specialisations for all Engineering branches.

Typically, after doing basic Engineering courses, intensive focus on specialisations start in the 5th semester across all Engineering streams .

COMPUTER SCIENCE ENGINEERING

SPECIALISATION IN ARTIFICIAL INTELLIGENCE

SPECIALISATION IN FULL STACK DEVELOPMENT

SPECIALISATION IN DATA ANALYTICS

SPECIALISATION IN CYBER SECURITY

SPECIALISATION IN BLOCKCHAIN TECHNOLOGY

SPECIALISATION IN UI/UX DESIGN

SPECIALISATION IN GAME DESIGN & AUGMENTED REALITY

SPECIALISATION IN PEGA UNIVERSITY ACADEMIC PROGRAM

SPECIALISATION IN MOBILE COMPUTING

SPECIALISATION IN DevOps (DEVELOPMENT OPERATIONS)

SPECIALISATION IN ROBOTIC PROCESS AUTOMATION

SPECIALISATION IN CLOUD COMPUTING & VIRTUALISATION TECHNOLOGY

SPECIALISATION IN DIGITAL MARKETING

5-YEAR DUAL DEGREE B.E. AND M.E. IN CSE BY RESEARCH

5-YEAR INTEGRATED B.TECH-M.TECH IN COLLABORATION WITH VIRTUSA

ENGINEER YOUR DREAMS

ELECTRONICS & COMMUNICATION ENGINEERING

SPECIALISATION IN EMBEDDED SYSTEMS & INTERNET OF THINGS (IoT)

SPECIALISATION IN VLSI DESIGNS

ELECTRONICS AND COMPUTER ENGINEERING

ELECTRICAL ENGINEERING

SPECIALISATION IN HYBRID & ELECTRIC VEHICLES

SPECIALISATION IN INDUSTRIAL AUTOMATION

CIVIL ENGINEERING

SPECIALISATION IN PUBLIC HEALTH ENGINEERING

SPECIALISATION IN CONSTRUCTION MANAGEMENT & STRUCTURAL ENGINEERING

MECHANICAL ENGINEERING

SPECIALISATION IN AUTOMOTIVE ENGINEERING

SPECIALISATION IN MECHATRONICS ENGINEERING

MECHATRONICS ENGINEERING

Apart from specialisations mentioned above, Engineering graduates from all disciplines have the option to join the following tracks-

- 5-Year Integrated B.E - MBA program
- Specialisation in Entrepreneurship and Innovation

4-Year Bachelor of Engineering

COMPUTER SCIENCE ENGINEERING

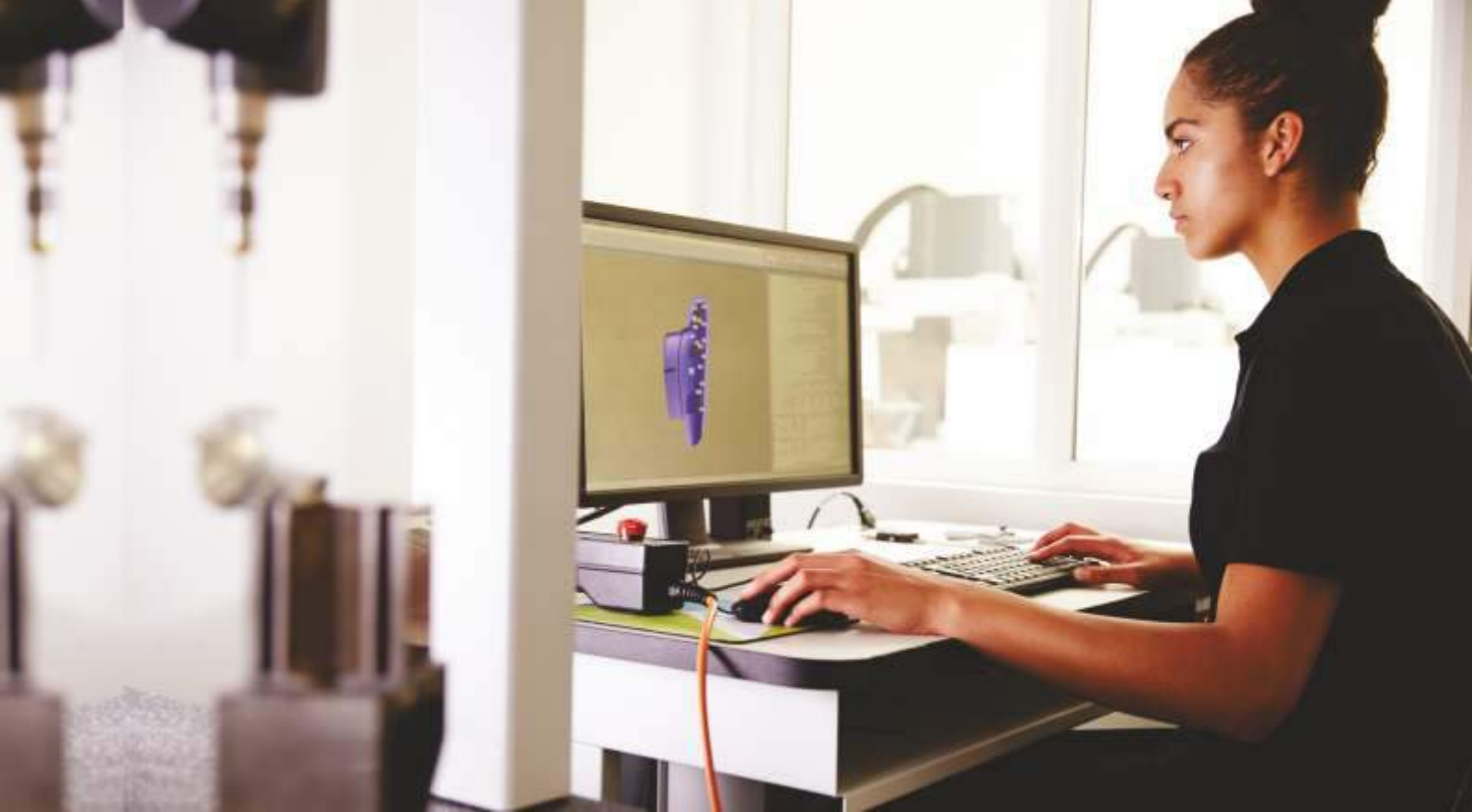


Program Objectives

The fundamental objective of Computer Science Engineering at Chitkara University 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 & Engineering.
- Gain knowledge of Mathematics through differential and Integral Calculus, Basic Science, Computer Science and Engineering Sciences.
- 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.



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:

- **Artificial Intelligence**
- **Full Stack Development**
- **Data Analytics**
- **Cyber Security**
- **Blockchain Technology**
- **UI/UX Design**
- **Game Design & Augmented Reality**
- **PEGA University Academic Program**
- **Mobile Computing**
- **DevOps (Development Operations)**
- **Robotic Process Automation**
- **Cloud Computing & Virtualisation Technology**
- **Digital Marketing**
- **5-Year Dual Degree B.E. & M.E. in CSE by Research**

Cutting Edge Labs

Industry leaders like Cisco, Google, Microsoft, Apple, Virtusa, VMWare, Quickheal, PEGA & nVidia have established their research labs at our campus for the Computer Science Engineering graduates.

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

Careers

Blue chip companies including, Google, Microsoft, Amazon, Infosys, Wipro. among others have been recruiting our Computer Science Engineering graduates since the inception of the program.

Some roles for which our graduates get hired include:

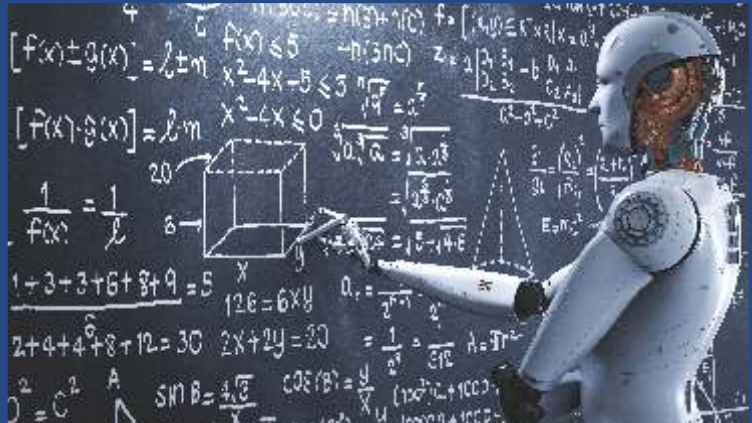
- Developers and Specialists in high-end Services and IT-product companies
- Development Engineers, Technical Leaders and Managers
- Consultants, Solution Developers and Entrepreneurs
- Computing Specialists in Research Labs and Tech Providers
- System/ Network Performance Analysts

Specialisation in Computer Science Engineering

ARTIFICIAL INTELLIGENCE

Introduction

Artificial Intelligence (AI) makes it possible for machines to learn from experience, adjust to new inputs and perform human-like tasks. Most AI examples that you hear about today – from chess-playing computers to self-driving cars – rely heavily on Deep Learning and natural language processing. Using these technologies, computers can be trained to accomplish specific tasks by intelligence processing large amounts of data and recognising patterns in the data.



Program Overview

Our Engineering program in Artificial Intelligence gives you the in-depth knowledge you need to transform large amounts of data into actionable decisions. The program and its curriculum focus on how complex inputs — such as vision, language and huge databases — can be used to make decisions or enhance human capabilities. The curriculum includes course work in Computer Science, Mathematics, Statistics, Computational Modeling, Machine Learning and Symbolic Computation.

When you graduate with this program from Chitkara University, you'll be computer savvy and have the skills our students are known for, with the added expertise in Machine Learning and Automated Reasoning that you'll need to build the AI of tomorrow.

Students in this program will take courses in Mathematics & Statistics, Computer Science, AI, Science & Engineering and Management. The program builds a solid foundation by covering the most popular and widely used deep learning technologies and its applications, including Computer Vision, Convolutional & Recurrent Neural Networks, Natural Language Processing, Tensor Flow and even Keras—laying the building blocks for truly expanded capabilities.

At the end of the program, our Computer Science Engineering graduates will have conceptual understanding on the below mentioned components of Artificial Intelligence and Machine Learning:



Python



Machine Learning



Deep Learning



Neural Networks



Computer Vision



Natural Language Processing

Specialisation in Computer Science Engineering

FULL STACK DEVELOPMENT

Introduction

As a Full Stack Developer, you are the go-to expert that companies rely upon 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 is offered at Chitkara University.

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 learners 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.

Specialisation in Computer Science Engineering

DATA ANALYTICS

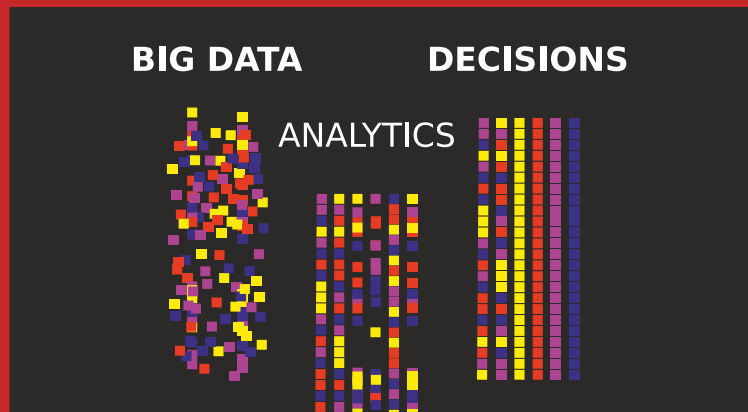
Introduction

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.



- 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

INDUSTRY LANDSCAPE



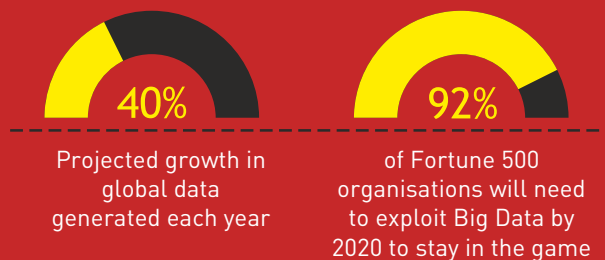
WHAT IS DATA ANALYTICS?

The scientific process of transforming data into insights for making better decisions and offering new opportunities for a competitive advantage.

Why is Data Analytics important?

It helps organisations harness their data and use it to identify new opportunities, leading to smarter business moves, more efficient operations, higher profits and happier customers.

THE SKILL GAP

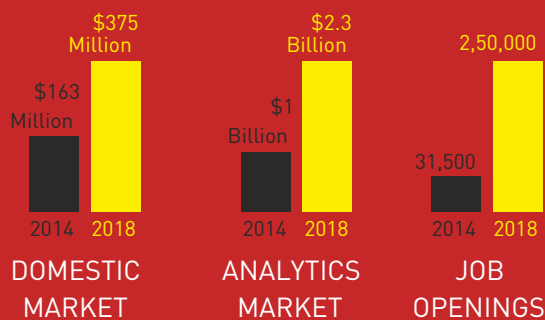


IN DEMAND SKILL SETS

- Predictive Analytics
- Data Analysis & Management
- Data Visualisation
- Business Intelligence
- SAS Programming
- New tools like R, Python

GROWING DEMAND

Projected Demand for Analytics Professionals in India



DATA SCIENTIST

THE
SEXIEST
JOB
IN THE 21st
CENTURY

HARVARD BUSINESS REVIEW, OCT 2012

EMPLOYMENT LANDSCAPE

→ GenPact
→ Infosys
→ Target
→ HSBC

→ Cap Gemini
→ Accenture
→ Wipro Analytics
→ Cognizant

→ Fractal
→ Citi Bank Analytics
→ EXL
→ Mu Sigma

→ HCL
→ Mindtree
→ Latent View
→ IBM

Specialisation in Computer Science Engineering

CYBER SECURITY

in collaboration with Quick Heal



Introduction

Cyber Security is a branch of Digital Forensic Science pertaining to legal evidence found in the cyber space and digital storage media. Cyber Security technologies, processes and practices are designed to protect networks, computers, programs and data from damage or unauthorised access.

This specialisation in Cyber Security at Chitkara University, in collaboration with Quick Heal Academy, 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 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 & Software Security and Cyber Law Enforcement.

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. 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 Consultant
- Cyber Forensics Planning
- Security Architect
- Cyber Operations Analyst
- System Administrator
- Security Network Engineer
- Cyber Forensics Solutions Architect
- Cyber Forensics Malware Analyst

About Quick Heal Academy

Quick Heal Academy is a division of Quick Heal Technologies Limited which is one of the leading providers of security software products and solutions in India.

Specialisation in Computer Science Engineering

BLOCKCHAIN TECHNOLOGY



Introduction

Blockchain is a revolutionary technology that enables peer-to-peer transfer of digital assets without any intermediaries, and is predicted to be just as impactful as the Internet. This specialisation in Computer Science Engineering gives students:

- An understanding and working knowledge of foundational Blockchain concepts.
- A skill set for designing and implementing smart contracts.
- Methods for developing decentralized applications on the Blockchain.
- Information about the ongoing specific industry-wide Blockchain frameworks.

The specialisation also covers a range of essential topics, from the cryptographic underpinnings of Blockchain Technology to enabling decentralized applications on a private Blockchain platform. This program will provide a broad overview of the essential concepts of Blockchain Technology – by initially exploring the Bitcoin protocol followed by laying the foundation necessary for developing applications and programming. It will also teach our graduates to design, code, deploy and execute a smart contract – the computational element of the Blockchain Technology.

Some of the major concepts you would understand are:

- Understand smart contracts, a core idea and computational model of Blockchain that enables automation, autonomy, scalability and transparency.
- Have an understanding and working knowledge of the emerging Blockchain Technology.
- How to design and program smart contracts and decentralized application.
- How to think of innovative application models, leveraging the Blockchain Technology.

DESIGN IS THE
FUNDAMENTAL
OF A HUMAN-MADE
CREATION THAT ENDS
EXPRESSING ITSELF
IN SUCCESSIVE OUT
LAYERS OF THE PRODUCT
OR SERVICE

iMAGINxp

Design Thinking and UX Design

ImaginXP is India's leading UX Design and Design Thinking organisation and is a pioneer in the field of UX Design and Design Thinking education, bringing together industry professionals and academicians to create industry relevant programs. Their vision is to make India a global design and innovation hub bringing world-class education to Indian students.

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Specialisation in Computer Science Engineering

UI/UX DESIGN

in collaboration with IMAGINxP

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. 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.

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.

Some key components of the program are:

- 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.
- Hands-on learning with the process of research, testing, development, content, and prototyping to test for quality results.

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.

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

Specialisation in Computer Science Engineering

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 in Game Design will help students explore the above questions and much more.

Students will be introduced to Game Design - its concepts, emphasising the basic tools: 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.

Students will study the creation of digital content and the practical application of VR/AR technologies. Some of the highlights of the program are:

- Research and develop your own VR/AR concepts by creating 2D and 3D digital artwork.
- 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.

Careers

According to Statista, Gaming and AR 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 professionals is experiencing a major uptick as more technologies make it out of R&D and enter the marketplace.

- 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 Computer Science Engineering

PEGA UNIVERSITY ACADEMIC PROGRAM



ABOUT PEGASYSTEMS

Pegasystems Inc. is the leader in software for customer engagement and operational excellence. PEGA's adaptive, cloud-architected software – built on its unified Pega® Platform – empowers people to rapidly deploy, and easily extend and change applications to meet strategic business needs. Over its 30-year history, PEGA has delivered award-winning capabilities in CRM and BPM, powered by advanced Artificial Intelligence and Robotic Automation, to help the world's leading brands achieve breakthrough business results.

PEGA's University Academic Program (UAP) offers dynamic University-level curriculum on cutting-edge PEGA software. Computer Science graduates at Chitkara University get an opportunity to master PEGA skills which lead to internship and employment at leading Global 2000 firms. Students have the option to pursue two different certification paths with PEGA, namely:

Technical Role Certification, with roles such as:

- Systems Architect
- Lead Systems Architect
- Decisioning Consultant
- Senior Systems Architect
- Robotics Systems Architect
- Marketing Consultant

Business Role Certifications, with roles such as:

- Business Architect
- Decisioning Consultant
- Marketing Consultant
- Data Science

Specialisation in Computer Science Engineering

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.

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.



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 & practice required to design & 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 and 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 including encryptions and networking.
- Understand mobile concepts to design and develop innovative applications for mobile devices.

Careers

The career options in the Wireless & Mobile Technologies include:

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

Specialisation in Computer Science Engineering

DevOps (DEVELOPMENT OPERATIONS)

Introduction

DevOps (development and operations) is an enterprise software development phrase used to 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 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.

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.

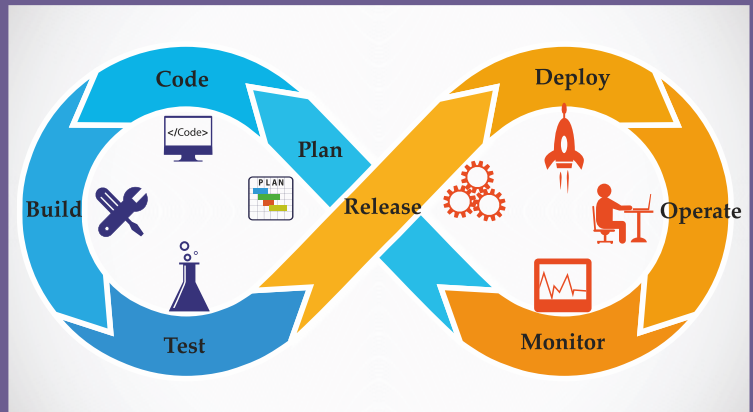
Careers

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 Computer Science Engineering

ROBOTIC PROCESS AUTOMATION

in collaboration with



Introduction

Automation is driving a new way of working. The future workplace will feature a blend of human and digital workforce ('bots') and this symbiotic relationship will create many exciting, new career possibilities.

Specialisation in Robotic Process Automation (RPA) for our Computer Science Engineering

graduates would prepare students to get industry-ready for this most in-demand and high-paying skills.



Robotic Process Automation is a game-changing technology that is designed to automate high-volume, repeatable tasks that take up a large percentage of a workers' time. Much like industrial robots have automated blue-collar work in factories, RPA Software is coming to automate white collar work.

The goal of this specialisation is to provide you with a clear overview of what RPA is, how it works and when to apply it, and at the same time gives you hands-on technology experience by helping you build a robot that automates a simple business process in the Automation Anywhere RPA Software. This way you'll both understand the bigger picture, and you will know how the technology works in practice. Further, we will look at how to pilot the technology in an enterprise setting so that you know what steps to take to succeed with any RPA initiative in your organisation. At the end of this specialisation, you will learn:

- What is RPA and how does it work
- Why is RPA a hot topic right now
- Components of the Automation Anywhere Platform
- Automation Anywhere Developer Software
- How to build a simple software robot
- How to pilot and implement RPA in enterprises

About Automation Anywhere

Automation Anywhere is the global leader in RPA Software with 3500+ enterprises across 90+ countries. and enable companies to operate with unprecedented productivity and efficiency by automating any part of the enterprise that can be automated with the most intelligent and intuitive Robotic Process Automation platform.

Specialisation in Computer Science Engineering

CLOUD COMPUTING & VIRTUALISATION TECHNOLOGY

Introduction

This specialisation prepares students to understand the emerging technologies of Cloud Computing & 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.



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.

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 along with basic fundamentals. Also there would be focus towards security, standards and applications in Cloud, including Cloud Security challenges, software as a service security and its common standards.

Collaboration with



Chitkara University has collaborated with VMware Academy so that our students can access VMware Certifications and start their career in the ever growing field of Cloud Computing & Virtualisation. Some of the topics covered under these certifications are:

- Cloud and Virtualization concepts
- Network Virtualization concepts
- Software-defined storage concepts
- IT Solutions for Digital Businesses
- Academic VMware vSphere: Optimize and Scale

Careers

All graduating Engineers with specialisation in Cloud Computing & Virtualisation find excellent placements in companies that require specific development skills towards working on such as Amazon Web Services (AWS), Microsoft Azure or Google Cloud Platform

- Cloud Solution Architects
- Cloud System Administrator
- Cloud Security Specialist
- Cloud Application Development

Specialisation in Computer Science Engineering

DIGITAL MARKETING

Introduction

One of the most fascinating and versatile fields, Digital Marketing is a booming industry not only in India but across the globe. With almost all businesses going online in their Marketing activities, the demand for Digital Marketers is increasing at a rapid rate and is opening doors for plenty of job seekers.

According to surveys conducted by several forums, the employment sector has seen a major share of jobs generated by the Digital Marketing Industry, in recent years.

As per various media reports, the year 2016 saw over 1.5 lakh job opportunities in the Digital Marketing domain and increasing to 8 lakh job opportunities in the year 2019. In India, this number is expected to grow rapidly with the advent of Digitalisation in the country.

Scope in Digital Marketing for Engineers is endless. Generally, Digital Marketers need to have competency in three main skills - Analytics, Competency with Technology & Strategy. The rigorous course work of an Engineering Degree helps our graduates to excel and develop all three. Thus, Engineering graduates with their technical know-how and strong Mathematical skills compliment Digital Marketing in the best possible way. Engineers have a logical thinking process - they like to research, experiment, create and innovate. Digital Marketing for Engineers acts as a perfect platform, where they can widen their horizon.

Some of the fundamental concepts covered in this specialisation are:

- Digital Marketing Fundamentals
- Facebook Marketing Fundamentals
- Facebook Advance Strategies
- YouTube Marketing
- Google Webmaster Tool
- Website Planning and Structure
- Facebook Ad Campaigns
- Google AdWords
- Google Analytics
- Search Engine Optimization

Some of the popular job profiles our Engineering graduates get placed at are:

- Market Research Analyst
- Digital Marketing Consultant
- SEO Manager/Professional
- PPC Search Manager
- Content Marketer/Manager
- Conversion Rate Optimizer
- Social Media Manager
- Email Marketer



Specialisation in Computer Science Engineering

5-YEAR DUAL DEGREE B.E. AND M.E. IN COMPUTER SCIENCE & ENGINEERING BY RESEARCH

This is a 5-Year integrated course offered to undergraduate Computer Science graduates students at the end of the third year. Students enroll for extra courses at the end of their third year and complete the first year equivalent of the ME by Research program while in the final year of the undergraduate programme. Dual Degree option enables students to acquire two degrees – B.E. and M.E. Degree by Research, by successfully defending Masters' thesis. The normal duration for dual degree programme is five years.

Students will work with our researchers at CURIN in research areas of their choice such as Artificial Intelligence & Machine Learning, AR/VR , Nanotechnology, Bio-informatics, Agritech, among other research areas.



5-YEAR B.TECH-M.TECH INTEGRATED COMPUTER SCIENCE ENGINEERING



in collaboration with



Chitkara University in collaboration with Virtusa has introduced unique 5-Year integrated Engineering program at Chitkara University in Himachal Pradesh.

Normally, it takes 2-Years to do M.Tech if you like to pursue it after finishing B.Tech and with some work experience. With this program you will save 1 complete year and get integrated B.Tech - M.Tech Degree from Chitkara University in industry collaboration with Virtusa, one of the leading global blue-chip IT company.

Some of the major highlights of the program:

- Intensive focus on Full Stack Engineering from Year-1.
- Interactive sessions with Virtusa software architects every semester.
- Problem based learning approach with Virtusa real life case studies.
- Hackathons will be conducted with Virtusa team every semester.
- Summer internship opportunity at Virtusa offices after the completion of 2nd year.
- 1-Year Internship in the 5th year at Virtusa offices with minimum monthly stipend of Rs. 15,000.
- Assured placement in Virtusa with joining salary of more than 5 lakh after the completion of the program.

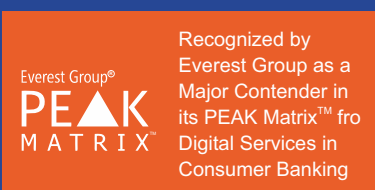


At Virtusa they accelerate business outcomes for their clients through their expert information technology consulting and outsourcing services. They support a wide variety of Forbes Global 2000 firms with services that span the entire spectrum of the IT services lifecycle. Their industry-leading solutions transform businesses not only for a better today, but also for a better future.

VIRTUSA IS ONE OF THE RENOWNED DAY-1 CAMPUS RECRUITER ACROSS TOP UNIVERSITIES IN THE COUNTRY



ACHIEVEMENTS Proud Recipients of



4-Year Bachelor of Engineering

ELECTRONICS & COMMUNICATION ENGINEERING



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 & 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 Mathematics 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 & 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.



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**

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

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

Specialisation in Electronics & Communication Engineering

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.

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 has on the society today.

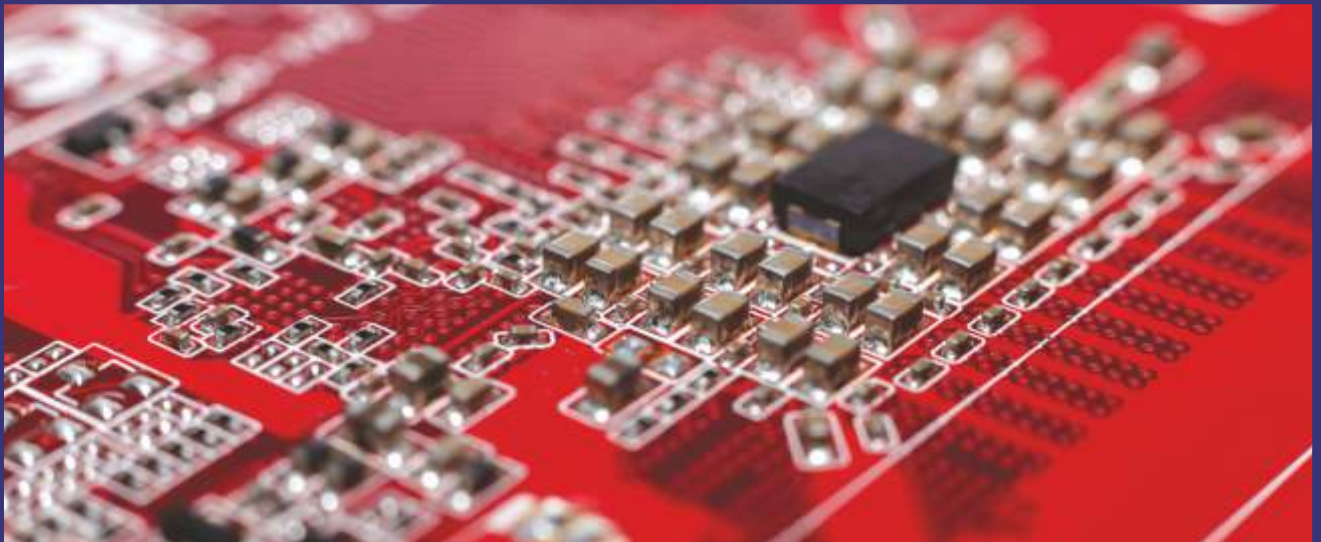
Careers

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% from 2016, and will reach 20.4 billion by 2020. Here are some of the roles:

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

Specialisation in Electronics & Communication Engineering

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 emphasises 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.

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, Tata Elxsi, RBEI, TATA, DELPHI, etc.

4-Year Bachelor of Engineering

ELECTRONICS & COMPUTER ENGINEERING



Program Objectives

Electronics & Computer Engineering is the integration of Electrical Engineering & 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 & 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 & 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 & 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 & Computing you will take modules in computer programming, operating systems, computer architectures & graphics, networking and the structure & 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 & Internet Networking, Mobile Devices, Multimedia Systems, Image Processing, Speech Analysis, Graphics, Computer Vision, and Artificial Intelligence with hands-on learning in our labs.

Careers

An Electronic Engineer can find a job in the consumer Electronics manufacturing organisation, Telecommunication and IT Industry, healthcare equipment manufacturing organisation, mobile communication, internet technologies, and power electronics industry.

As a student at Chitkara University you can choose your own path. ECE program at Chitkara University offers in-depth study in a wide range of disciplines 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

4-Year Bachelor of Engineering

ELECTRICAL ENGINEERING



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 & 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. 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 wiring & lighting installations in buildings, automobiles & 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.



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**

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 Electrical Engineering

HYBRID & ELECTRIC VEHICLES

Introduction

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



Hybrid & 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.

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 & 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 Electrical Engineering

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.

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 & 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

4-Year Bachelor of Engineering

CIVIL ENGINEERING



Program Objectives

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. They work with many other professionals in teams to make our world a better place.

A Degree in Civil Engineering covers a plethora of scientific topics, including, Mechanics, Hydraulics, Materials Science and Statistical Analysis. At 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 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.
- Monitor and evaluate the work at a job site by acquiring organisational skills.



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 Management & Structural Engineering**



Cutting Edge Labs

Students have access to many facilities in the form of various 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 Civil Engineering

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

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 Civil Engineering

CONSTRUCTION MANAGEMENT & STRUCTURAL ENGINEERING



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.

This specialisation in Construction Engineering Management and Structural Engineering 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. 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 focus of the program will primarily be on the conception, analysis, design and construction of the building components to resist loads arising from internal and external forces. 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

4-Year Bachelor of Engineering

MECHANICAL ENGINEERING



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.

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.



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**
- **Mechatronics**

Cutting Edge Labs

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

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

Modern computing facilities are available for students 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, etc.

Specialisation In Mechanical Engineering

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 course work 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.

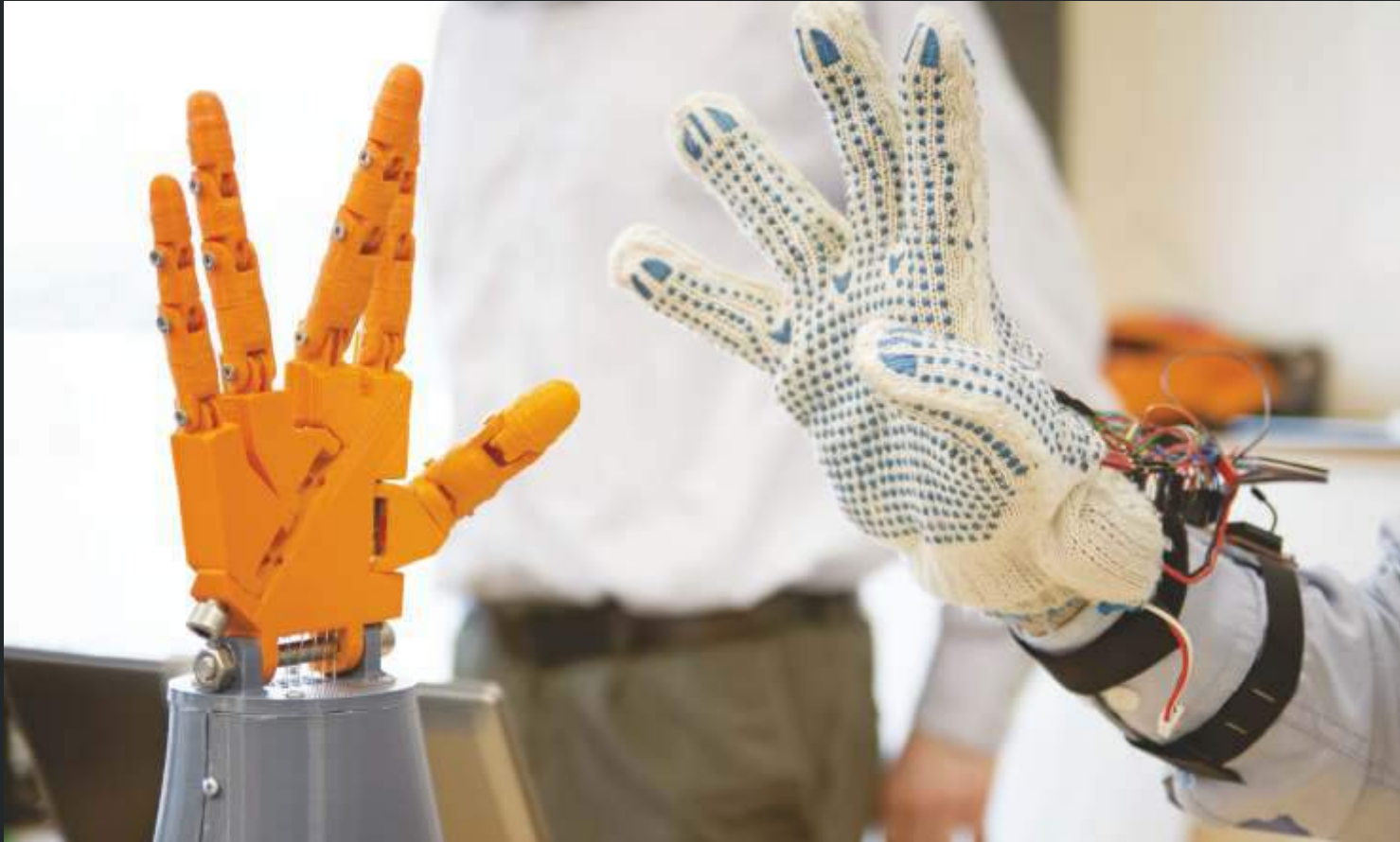
Typical employers of Automotive Engineers include: car, commercial vehicle and motorcycle manufacturing companies; companies serving specialist markets such as sports or luxury cars and test laboratories automotive component suppliers tyre manufacturers, accessory and safety equipment manufacturers fuel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

4-Year Bachelor of Engineering

MECHATRONICS ENGINEERING

(Mechanical students can choose Mechatronics as their specialisation after the end of the 2nd Year.)



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.
- Apply Mechatronics or Automated solutions to the transfer of material, components or finished goods.
- Study the feasibility, cost implications and performance benefits of new Mechatronics equipment.

Academic Framework

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

- 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:

- 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.



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



5-Year INTEGRATED MBA PROGRAM

**CHITKARA
BUSINESS
SCHOOL**

Our Engineering students have the option to join Chitkara Business School's highly ranked MBA programs after finishing their undergraduate studies.

Our MBA Programs have established an unassailable reputation for strong campus recruitment of graduates with Fortune 500 companies. Students who join our integrated MBA program will cover additional courses during their graduation in the summer term. They will be intensive focus on developing strong communications skills and mastering management principles during the summer terms across first 3 years of the program.

After finishing the undergraduate Engineering program, students will be joining the 2nd year of the MBA programs and will have option to choose the following specialisations:

- Marketing
- Finance & Banking
- Business Analytics
- Rural Management
- Supply Chain Management
- Healthcare

In the 5th year, students will undertake internship in blue chip corporations across industry, and kick-start their corporate journey from there on.

Specialisation for all Engineering graduates

ENTREPRENEURSHIP & INNOVATION



The specialisation in Entrepreneurship & Innovation for our Engineering graduates is designed to prepare future entrepreneurs with the skills & knowledge to start their own businesses.

The specialisation will focus on identifying, analysing and evaluating global & local business opportunities, creating new independent business ventures or new ventures within existing firms; developing creativity and understanding innovation; environment assessment for new ventures; marketing research & developing effective business plans to obtain financing, legal issues related to starting and operating a family-owned businesses.

Major program objectives will be:

- Be critical thinkers who are capable of identifying business opportunities by using cutting-edge analytical tools.
- Communicate clearly to develop and evaluate business plans and funding proposals.
- Apply relevant financial principals to assess start up capital needs, cash flow needed for growth, break-even analysis and pre and post-funding valuation.
- Effectively understand and implement a marketing plan for a new venture.

Also, we give students an insight into Event Management as it is a highly practical course providing a perfect blend of core Management and specialist event Management knowledge and skills to be successful in the industry. A unique and focal aspect of the program is the opportunity to gain real world industry experience and build strong industry links through the development of your Industry Experience Portfolio (IEP). You are able to tailor your portfolio to the industry of your choice, and in your final year you will be required to apply your portfolio knowledge to plan, manage and analyse your own business idea.

PROGRAMS IN COMPUTER APPLICATIONS

3-Year BCA | 5-Year Integrated BCA-MCA
2-Year MCA (Lateral Entry)



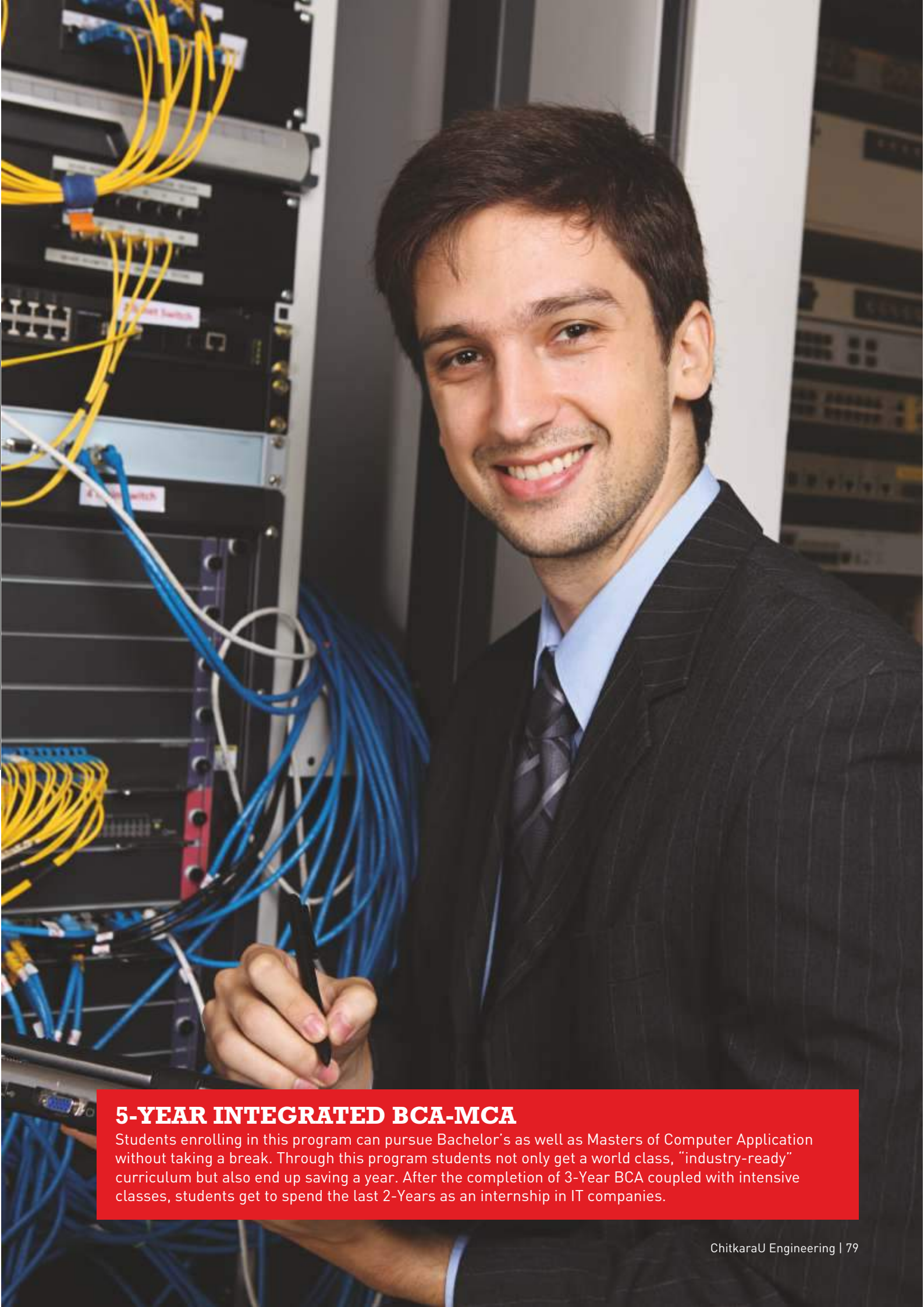
Program Overview

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. In our BCA | MCA programs, students are exposed to various areas of Computer Applications including the latest developments in the industry.

Our program in Computer Applications caters to the foundation of computing principles and business practices and to train the students to analyse problems in a wide range of applications. This program provides exposure to the students to enterprise software management methodologies.

Some of the major topics covered in the BCA | MCA programs are:

- Introduction to Computer Organisation
- Data Structures
- Programming in Java
- Computer Architecture
- Software Engineering
- Operating Systems
- Digital Image Processing
- Programming in C & Algorithm Design
- Object Oriented Programming in C++
- Microprocessors
- Database Management Systems
- Computer Networks
- Computer Graphics
- Compiler Design



5-YEAR INTEGRATED BCA-MCA

Students enrolling in this program can pursue Bachelor's as well as Masters 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.

Partnership with IT Industry

Marquee companies such as Amazon, VMWare, Virtusa, Red Hat, Automation Anywhere and Cisco Network have developed & deployed IT industry relevant curriculum on emerging technologies for our Computer Application programs.



Employment Areas

- Software Development Companies ● Technical Support ● System Maintenance ● Consultancies
- Computers and Related Electronic Equipment Manufacturers ● Schools and Colleges
- Security and Surveillance Companies ● Traffic Light Management ● Desktop Publishing
- Financial Institutions ● Government Agencies ● Insurance Providers ● Banks

Job Types

- Software Developers ● Systems Administrators ● Project Manager ● Chief Information Officer
- Computer Programmers ● Computer Training ● Computer Systems Analysts ● Computer Scientists
- Computer Support Service Specialist ● Database Administrators ● Computer Presentation Specialist
- Commercial & Industrial Designers ● Independent Consultants ● Information Systems Manager
- Software Publishers

Campus Recruiters for BCA & MCA Graduates

Some of the major companies that visited Chitkara University and hired our graduates:





CHITKARA
UNIVERSITY
INDIA



**FORMULA
STUDENT**

Institution of
MECHANICAL
ENGINEERS

096

**CHITKARA
UNIVERSITY, PUNJAB**

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