



# B.Tech

## MATH $\Sigma$ MATICS & COMPUTING



Learn Mathematics and Computing as a tool for one another



# DA-IICT at a Glance

**DA-IICT** was founded in 2000 as a unique university devoted to the cutting-edge interdisciplinary area of Information and Communication Technology (ICT). ICT was emerging as the technology of the future bringing in the fourth Industrial Revolution. Well known and highly qualified faculty members joined DA-IICT and developed a curriculum and research program steeped in all aspects of ICT, societal, scientific, and technical. This spirit has been nurtured for the last 18 years and DA-IICT wants to continue its excellence in interdisciplinary teaching and research well into the future.

The Act No. 6 of 2003 of the Gujarat Legislature provided for the establishment of the DA-IICT and conferred on it the status of a University. On 30 November 2004, the DA-IICT was included in the list of Universities maintained by the University Grants Commission under Section 2(f) of the UGC Act, 1956. DA-IICT is a member of the Association of Indian Universities (AIU) as approved by the AIU at its 84th Annual Meeting held during 12-14 November 2009. The National Assessment and Accreditation Council, Government of India has accredited DA-IICT with an **'A' Grade in 2017**.

## Vision and Mission

The vision of the institute is to become a globally recognized institution that offers innovative programs, outstanding faculty, an atmosphere of innovation, a responsive administration, a vibrant campus and a collaborative learning environment that continuously adapts to the changing landscape of research and innovation and the future of work. Toward this, we plan to design and deliver academic programs in both disciplinary and multidisciplinary domains to prepare students for a rapidly evolving work environment.

**Ranked among top 100 Engineering Institution by MHRD, Govt of India (NIRF-2019 rankings)**

**NAAC (Accreditation): A Grade (Year- 2017)**  
**Selected for Center of Excellence award**  
**Annual Student Scholarships: INR 3-4 Crores**

**First Private University** to mentor PPP model based (central, state and industry funded) Institute - IIIT Vadodara (build academics and provided faculty support)

Only **Anchor Institute** in Gujarat to mentor the Faculty members of Engineering Colleges in Gujarat

Awarded the **Best University** in Innovation in Gujarat by Govt. of Gujarat in 2017

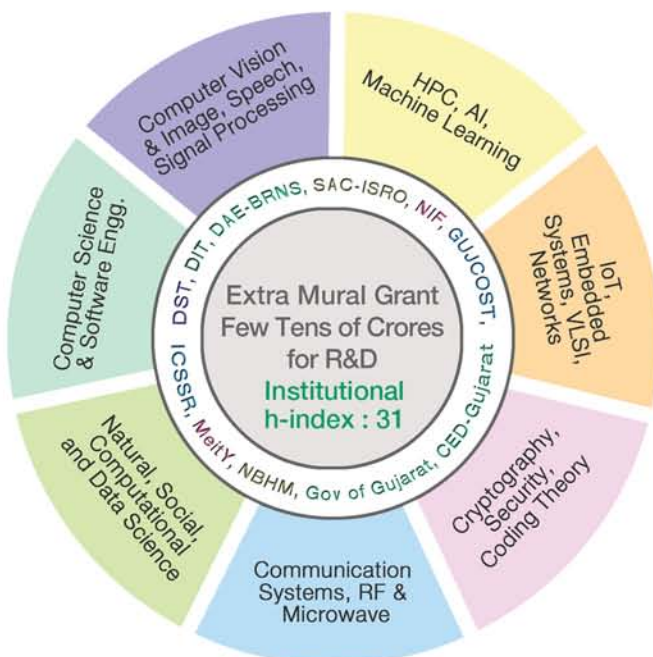




# Academics and Research at DA-IICT

Interdisciplinary and Multidisciplinary Research Oriented Academic Programs

Program Level	Name of the Program	Duration	Unique Features
Doctoral	PhD	4-6 years	- Entry through national level entrance test & interview
PG	<b>MTech</b> (ICT)	2 years	- Stipend for GATE qualified students
	<b>MTech</b> (CS & ML)	2 years	- In collaboration with <b>C R Rao Inst.</b>
	<b>MTech</b> (CS-DS and CS-IS)	2 years	- In collaboration with <b>IIT Jammu</b>
	<b>MSc</b> (IT)	2 years	- Industry oriented IT program
	<b>MDes</b> (CD)	2 years	- Fusion of ICT and Design
	<b>MSc</b> (Data Science)	2 years	- SAS Global Certification
UG	<b>BTech</b> (ICT)	4 years	- 1st institute in India to offer <b>unique program</b> in ICT in 2001
	<b>BTech</b> (Hons in ICT; minor in Computational Science)	4 years	- 1st institute in India to offer UG program in Computational Science
	<b>BTech</b> Mathematics and Computing (MnC)	4 years	- Intersection of Computer Science & Applied Mathematics to solve complex problems



## International Projects

NSF-USA, Indo-French, Indo-Spain

## Industry / Consultancy Projects

nVIDIA (USA), FactSet (UK), Vista (India), ISRO Amnax Technology, GoG (Climate Dept.)

## Major MOUs / LOUs

Univ. of Oregon (USA), Univ. of Auckland (NZ), Univ. of Swaziland (UoS), Univ. of Dayton (USA), Univ. of Hildesheim (Germany), Univ. Mara (Malaysia), Univ. of Evora (Portugal), ISEP (France), ISRO, Indian Navy, ISI Kolkata, TCS, Samsung R&D, IIT Gandhinagar, IIT Jammu, IIIT Vadodara, C R Rao AIMSCS, EDII



# Why a B.Tech program in MnC?

The past few decades have witnessed large scale technological advancements which have facilitated probing at scales that was not accessible earlier. No wonder, we have information like never before, however, unravelling the mysteries hidden in them remains a challenge. Industry, academia and innovators have realized that such problems cannot be looked at through the eyes of any single discipline, but rather, requires interdisciplinary and multidisciplinary approaches. The combined knowledge area of mathematics and computer science provides access to many different approaches that can be adopted for the exploration of such information and thereby creating new pathways for future scientific developments and innovation. Not surprisingly, graduates with a strong foundation in mathematics and computer science have created a unique niche for themselves and there has been an increasing requirement of graduates of these disciplines.

## DA-IICT philosophy, vision and MnC

DA-IICT since its inception has been an institute of interdisciplinarity and contemporary domains. B Tech programs in ICT and ICT honours with minor in computational science are testimonials to this. With its experience and expertise at institutional innovation and knowledge reform, DA-IICT is well-poised to provide knowledge and training to young minds to provide solutions to the challenges mentioned earlier. The B.Tech program in Mathematics and Computing (MnC) at DA-IICT, started in 2020, is therefore a strong step in this direction.

MnC embodies the fusion of Mathematics and Computer Science. It is obtaining wide acceptance as a distinct discipline dealing with Mathematics as a fundamental intellectual tool in computing and with Computing as a primary component of mathematical problem solving. The curriculum focuses on expanding mathematical, algorithmic and computational thinking abilities of the students. A strong mathematical foundation will enable the students to study and analyse abstract concepts and to model many real life problems as mathematical problems. Algorithmic thinking will enable them to solve these mathematical problems in an automated way while computational thinking will enable them to evaluate the efficiency of these solutions. The rigour in curriculum's content will provide an adequate and solid foundation as well as opportunities for skill development in MnC. The wide variety of competence acquired through the curriculum will make the students eligible to apply for a whole range of occupations and for research and managerial careers in later life.





# Program Overview

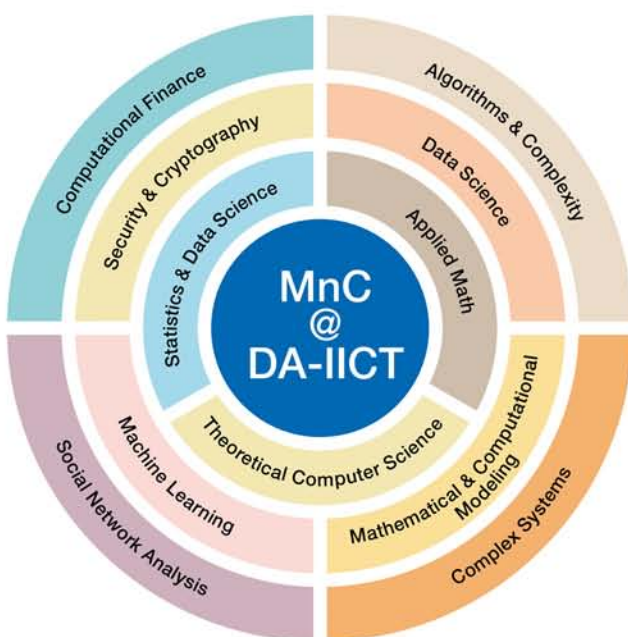
MnC program at DA-IICT has been carefully designed in consultation with leading experts from industry and academia from India and abroad. The curriculum blends together foundational aspects of mathematics and computer science with emerging areas in contemporary science and technology. The core course component in the first two years aims to build a solid foundation in mathematics, computer science and humanities and social sciences. Emphasis here is on both technical and communication and creative skills. Core courses in humanities also bring in the role and importance of ethics in technological developments. Elective courses provide exposure in several related disciplines and enable the students to choose and pursue the path of their interest. Overall, the curriculum is a syllabus of courses that ensures competence, quality and adaptability of the graduates.

## Salient Features of the program

- The program is designed keeping in mind the emergent areas in modern science and technology.
- The program structure is contemporary with blend of courses in traditional as well as new emergent areas.
- A rigorous program that also provides flexibility in learning. It has a strong foundation and at the same time inculcates interdisciplinary thinking and provides the required skill.
- The program core consists of 42% courses in computer science, 36% in mathematics and 22% in humanities and social sciences and combined knowledge areas of math and computing
- MnC electives in the broad areas of theoretical computer science, applied math and statistics and data science.
- Open electives in the areas of engineering arts and design, humanities, social science & management.
- Independent projects, rural, industrial and research internships that help the students to expand their knowledge base and pursue the path of their own interest.

## Careers

Apart from the available prospects in traditional computer science and IT, graduates of the BTech (MnC) program from DA-IICT will be suitably prepared for jobs in emerging niche areas in data science, computational finance, mathematical modelling and large-scale computer simulation. Our graduates will also be able to pursue career paths in higher education in areas of applied maths, computer science and computational sciences.





# Program Structure

## SEMESTER-1

Mathematical, Algorithmic, & Computational Thinking  
 Computer Organization and Programming  
 Discrete Mathematics  
 Digital Logic Design  
 Language and Literature

## SEMESTER-2

Functions of Single Variable and ODEs  
 Object Oriented Programming  
 Data Structures and Algorithms  
 Linear Algebra  
 Approaches to Indian Society

## SEMESTER-3

Probability and Random Processes  
 Operating Systems  
 Design and Analysis of Algorithms  
 Functions of Several variables and PDEs  
 Database Management Systems  
 Science, Technology, Society

## SEMESTER-4

Mathematical Statistics  
 Theory of Computation  
 Parallel, Distributed, and Dynamic Algorithms  
 Real and Complex Analysis  
 Numerical and Computational Methods  
 Environmental Studies

## SEMESTER-5

Mathematical Optimization  
 Modelling and Simulation  
 Algebraic Structures  
 Principles of Economics  
 MnC Elective-1  
 MnC Elective-2

## SEMESTER-6

Machine Learning  
 Open Elective – 1  
 MnC Elective – 3  
 MnC Elective – 4  
 MnC Elective – 5  
 Independent Project – 1/ MnC Elective – 6

## SEMESTER-7

MnC Elective – 6 / Independent Project – 1  
 MnC Elective – 7  
 MnC Elective -8  
 Open Elective – 2  
 MnC Elective – 9  
 Independent Project – 2 / MnC Elective – 10 /BTP – 1

## SEMESTER-8

MnC Elective – 10 / BTP-1  
 BTP-2

## Representative list of electives

Graph Theory and Algorithms	Data Mining and Visualization	Stochastic Simulation
Approximation Algorithms	Human Computer Interaction	Dynamical Systems
Computational Complexity	Natural Language Processing	Computational Number Theory
Randomized Algorithms	Network Science	Fluid Dynamics
Quantum Computing	Time Series Analysis	Game Theory
Introduction to Cryptography	Software Engineering	Queuing theory
Block Chain and Cryptocurrencies	Hypothesis Testing	Operations Research
Adversarial Machine Learning	Multivariate Statistics	Functional Analysis
Machine Learning and Security	Bayesian Analysis	Stochastic calculus for finance
Introduction to coding theory & Applications	Financial Data Analysis	Computational finance
Compilers	Machine Learning in Finance	



# Admissions

## Total Seats: 50

(50% of the seats are reserved under Gujarat Category)

## Eligibility Criteria

The minimum academic qualification for admission to the programs is that the candidate must have passed or appearing in 2021 in the final examination of 10+2 (Class XII) or its equivalent with Mathematics, Physics and any one of Chemistry/Bio-technology/Computer Science/Biology.

## Selection Criteria

Admission to the B. Tech (MnC) program will be based on the All India Rank of Joint Entrance Examination 2021 (JEE-2021) Main, which is conducted by the National Testing Agency, Government of India.

The short-listed candidates will be offered admission (confirmed/waitlisted) in order of their merit (based on the All India Ranking of JEE 2021).

## Fees Structure\*

**Tuition Fee:** Rs. 86,000 per Semester

*\*Subject to revision*

## Scholarships

### DA-IICT Merit and Merit-cum-Means Scholarships:

A few students admitted to the program are awarded merit and merit-cum-means scholarships equivalent to full tuition fees.

### Mukhya Mantri Yuva Swavalamban Yojna, Government of Gujarat:

The Scheme provides financial support to bright and needy students whose parents yearly income is upto Rs. 6.00 lakh.

### Cybage Scholarships:

This scholarship is granted to students whose parents annual income is upto Rs. 3.00 lakh. The scholarship is limited to 80% of the semester tuition fee.

### Education Loan:

The Institute will facilitate the students to avail educational loan from selected banks.



For Inquiries: Email: [ug\\_admissions@daiict.ac.in](mailto:ug_admissions@daiict.ac.in)

For details please visit: [www.daiict.ac.in](http://www.daiict.ac.in)



# The Faculty

## Blending academic excellence, research eminence & professional experience

DA-IICT successfully attracts the best teaching and research talents who have completed their doctoral studies at premier institutes in India (such as IISc, ISI, IPR, PRL, IITs, IIITs, NITs, HBNI, Central Universities etc.) or international institutes of repute (in USA, Canada, Europe, Australia, Korea, Singapore etc). All our faculty members are active researchers in their respective fields. Most of our faculty members have significant international exposure in terms of research and industry experience, and are involved in national/ international collaborative research projects. They are an exceptional group of academicians

in Mathematics, Statistics, Computer science, Physics, Data Science, Computational Science, Communication, Signal Processing, Electronics, Design, Humanities and Social Sciences who are determined to push the frontiers in research and technology. They conduct advanced research and the new knowledge they create routinely benefits classroom learning.

The complete list of our faculty members and their research interests can be found at:

<https://www.daiict.ac.in/people/faculty/>

## The Right Career Where the Degree can Take you

### Placements:

The Placement Cell at DA-IICT works professionally with the Industry to explore opportunities for DA-IICT graduates for placements. The Cell makes its best efforts to reach out to all sub-sectors of the industry in order to ensure that DA-IICT graduates spread across the industry. DA-IICT has hence contributed to the industry by successfully delivering fresh recruits who have contributed continuously to the growth of the industry by being a part of the top-notch organizations.

<http://placement.daiict.ac.in/>

### Alumni Network:

The DA-IICT Alumni Association exists to create and maintain a life-long association between the Institute and its alumni. The Association works to connect alumni, support students and build an extraordinary Institute experience through a diversity of events and celebrated traditions. The mission of the Association is to cultivate strong bonds between alumni, students and the Institute, to keep alumni acquainted, and create a network enabling them to remain involved with their alma mater.

<https://daiict.almaconnect.com/>

#### Placement Statistics (Last 3 years)

##### Median Salaries in INR

PG: 5.5 Lakhs, 6 Lakhs, 7 Lakhs  
UG: 9 Lakhs, 10.5 Lakhs, 14 Lakhs

##### Highest Salaries in INR

52.5 Lakhs, 39 Lakhs, 43 Lakhs

#### Students opting for Higher Studies (For MS & PhD)

CMU, Georgia Tech, MIT, ASU, Cornell Univ, Maryland, Colorado Boulder, Univ. of California, Texas A&M, Univ. Oxford UK, John Hopkins, Ecole Polytechnic de Montreal Canada, ISEP France,







# Campus Life

DA-IICT is spread over 50 acres of land in Gandhinagar, Capital City of Gujarat. The DA-IICT campus is carefully planned and designed as an environmentally conscious campus in the country. The architecture of DA-IICT is functional, but what surrounds it is a fascinating garden. The entire design is oriented towards preserving the environment. The campus with trees, lawns and bushes bearing green leaves and exotic flowers surrounding the buildings and pathways instils environment consciousness among students and enrich their learning. The campus also has a herb garden with species of rare medicinal plants.

The landscape was planned and developed in a manner that no rainwater is lost. The irrigation for campus garden and lawns is carried out with recycled water. Its solid waste management system churns out organic fertilizer out of dry leaves, vegetable and food waste generated from food courts.

The campus is a haven for bird-watchers, with a variety of species of birds being spotted.

DA-IICT can be reached in about 30 minutes from Sardar Vallabhai Patel International Airport and the Central Railway Station located in Ahmedabad.





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