Dhirubhai Ambani Institute of Information and Communication Technology

DA-IICT

M.Tech. (ICT)
with specialization in
VLSI and
Embedded Systems

Academics

Service to Society

DA-IICT

Research & Innovation

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 20 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, 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) 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	**MTech** (ICT) **MTech** (CS & ML) **MTech** (CS-DS and CS-IS) **MSc** (IT) **MDes** (CD) **MSc** (Data Science)	2 years 2 years 2 years 2 years 2 years 2 years	- Stipend for GATE qualified students - In collaboration with **C R Rao Inst.** - In collaboration with **IIT Jammu** - Industry oriented IT program - Fusion of ICT and Design - SAS Global Certification
UG	**BTech** (ICT) **BTech** (Hons in ICT; minor in Computational Science) **BTech** Mathematics and Computing (MnC)	4 years 4 years 4 years	- 1st institute in India to offer **unique program** in ICT in 2001 - 1st institute in India to offer UG program in Computational Science - Intersection of Computer Science & Applied Mathematics to solve complex problems
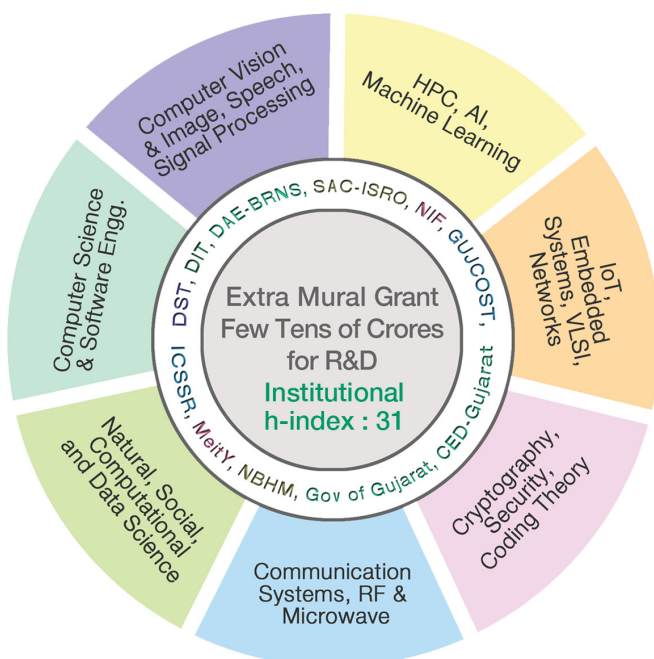
International Projects
NSF-USA, Indo-French, Indo-Spain

Industry / Consultancy Projects
nVIDIA (USA). FactSet (UK), Vista (India), ISRO Amnex 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

Very-large-scale integration (VLSI) is a domain, where we see the millions of transistors embedded into a single chip, which was started in early 1980s. VLSI technology became more prevailing due to its high packing density, high speed and low power consumption. Embedded systems are a domain where the VLSI technology is used to build an application specific system and meet the user requirements. VLSI and embedded systems have opened up the avenues in the various fields such as aerospace, agriculture, automobile, consumer electronics, biomedical, analog and digital ICs etc. As per the statistics provided by Dr. Handel Jones, International Business Strategies (IBS) (2015) global VLSI/Semiconductor market will around $600B by 2025. This revenue will be mainly form internet of things (IoT) semiconductor hardware and sensor market, which contributes about $110B, semiconductor foundry, DRAM, Flash memory market together contributes about $240B by 2025. Likewise, the global embedded systems market is anticipated to reach $100B by 2025. Thus, VLSI and embedded systems have major role in the upcoming years to offer one of the best job opportunities.

To offer best service for the VLSI and embedded system industry considering the research and development, it is desirable to have a knowledge of semiconductor physics, IC fabrication technology, analog and digital design, digital and analog system architecture, low power design and embedded system design, real time operating systems etc. Thus, in summary an VLSI and Embedded systems (VES) is one of the important components of the Information and Communication Technology (ICT).

The VES research group of ICT department in DA-IICT encompasses wide range of spectrum from microelectronics, digital and analog system architectures, VLSI electronic-design automation, nanotechnology, MEMS, embedded systems and designs. The department has excellent research laboratories with availability of various state-of-the-art CAD tools, low power system testing, PCB fabrication facility to carry out the outstanding research with VES group of DAIICT. The core research areas and on-going projects are in the areas of

- Low power processor design, high performance using ARM processors, edge computing
- Ultra-low power, ultra-low voltage IC design
- Embedded systems and IoT
- MEMS
- Sensor design and instrumentation
- Nanoelectronics and nanotechnology
- AI/ML chip design
- Robotics,
- System cybernetics
- Circuits and systems – design, modeling & simulation, graphene FETs & on-chip interconnects
- Machine learning for VLSI architectures

The VES research group has led to various publications in Book chapters, Journals and Conferences of repute, bringing several funded projects and incubation of many start-ups. The department has strong research group, relevant curriculum, expertise faculties and dedicated labs for supporting various Ph.D. and M.Tech. students in VLSI and Embedded systems specialization. The department provides wide range of core VLSI/Embedded systems subjects together with many electives from other domains such as machine learning, signals and systems, IoT, computational theory to make the program more comprehensive and dynamic. The department is committed in delivering both excellences in teaching and high-quality research. Research in VES group at DAIICT is focused on providing ICT based solutions to the problem, which are of national importance.

In summary the M.Tech in VLSI and Embedded systems will help the students to:
- Acquire a strong foundation in the basics of VLSI and embedded systems
- Develop required design skills in hardware and software required for VLSI and embedded systems
- Demonstrate system design problem skills
- Have hands on experience on most of the CAD and IDE tools used in the industry
- Carry out the research on the topics related with national importance
- Have exposure to the start-up ecosystem
- To acquire industry ready skills in the VLSI and embedded systems

Characterization of program: This program has an intersection with machine learning, IoT, sensor networks, programming along with VLSI and embedded system.

Uniqueness of the program: Practice oriented and live examples-based programs. The program aims to carter to the following audience.

1. Traditional engineers and science graduates with good mathematical aptitude, good knowledge of electronics, physics and computer science.
2. Working professionals in the engineering background in electronics who are thinking to enhance their technical skills and become competent in the field of VLSI and embedded systems.

Program Structure and Objectives

The primary objective of M.Tech in VLSI and Embedded systems program is to develop the skilled professional workforce that is prepared to address the increasing needs in the rapidly expanding area of VLSI and embedded systems. In the current area, for career progression, one needs to understand the flow of VLSI and embedded systems design through analytical skill. Hence, it is absolutely necessary nowadays, to develop human resource with a skill to design VLSI and embedded architecture and deliver the potential use of it to aerospace, agriculture, automobile, consumer electronics, biomedical applications and so on. The DAIICT course curriculum is designed in a way where candidates will be getting a hands-on exposure and ability to bring the technology from the lab to field.

As students come from different academic backgrounds, it is important to fit everybody up to same level and speed. To do so, we offer several foundation levels courses in the first semester. In subsequent semesters, pedagogical approach focused on learning by doing is incorporated in the form of mini-projects and case studies in addition to advance courses. The program relies on a wide range on teaching methods including lectures, tutorial, case study analysis, lab exercises, projects as well as extra circular activities throughout the year.

The 2nd year is designated for the M.Tech project along with specialization cores to facilitate students to have in-depth knowledge of their projects and get a glimpse to find out the research gaps in the respective domain and propose a novel solution to the research gaps and implementation. M.Tech students work closely with in campus faculty members and perform cutting edge research related to VLSI and embedded systems.
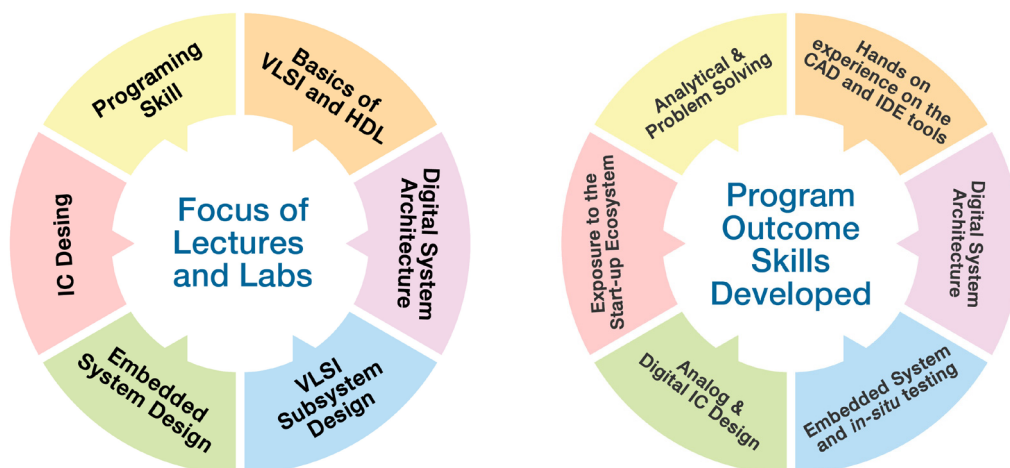
Course Curriculum

Autumn Semester (Semester-I)

Course Name	Credits (L-T-P-C)
Communication Skills and Technical Writing	2-0-0-2
Programming Lab	1-0-4-3
Introduction to Embedded Systems	3-0-2-4
Basics of VLSI	3-0-0-3
Digital Design using HDL & FPGA	3-0-2-4

Winter Semester (Semester-II)*

* Three courses from specialization and one technical elective

Course Name	Credits (L-T-P-C)
Digital System Architecture	3-0-2-4
Embedded System Design	3-0-2-4
VLSI Subsystem Design	3-0-0-3
Analog IC Design	3-0-0-3
Technical Elective-I	3-0-0/2-3/4

Autumn Semester (Semester-III)

Course Name	Credits (L-T-P-C)
M.Tech. Research 1	0-0-6-3
M.Tech. Research 2	0-0-6-3
Low Power VLSI Design	3-0-0-3
Selected Topics in VLSI	3-0-2-4

Winter Semester (Semester-IV)

Course Name	Credits (L-T-P-C)
M.Tech. Research 3	0-0-6-3
M.Tech. Research 4	0-0-6-3
M.Tech. Research 5	0-0-6-3
M.Tech. Research 6	0-0-6-3
M.Tech Thesis	0-0-2-1

Technical elective in the area of:

- VLSI CAD
- VLSI testing and verification
- MEMS
- Internet of Things (IoT)
- AI/ML using Embedded Hardware
- Smart Sensor Networks
- IoT Interface Electronics

Total Seats: 16,   Seats through GATE : 12   and Seats through Non-GATE : 4

Eligibility Criteria

- A candidate with a qualifying degree in any one of the following:

    B.E./B.Tech. degree in ICT or allied disciplines such as CS/EE/EC/IN

    M.Sc. degree in Electronics (For non-GATE Candidates)

- The aggregate marks in the qualifying degree should not be less than 60% or equivalent as per the norm set by the degree awarding Institute/University. Possession of a valid GATE score in a discipline specific to the specialization as mentioned for B.E./B.Tech. Degree in ICT or allied disciplines such as EE/EC/IN.

Selection Process

Admission to M. Tech. (ICT) is open to those who have a valid GATE score in the disciplines of Electronics & Communication Engineering (EC), Electrical Engineering (EE), Instrumentation Engineering (IN) only. Selection of the candidates will be based on the GATE score and performance in the interview. For Non-GATE candidate's selection will be based on their qualifying degree and performance in the interview. For Non-GATE candidate's weightage will be as follow: 40% weightage for qualifying degree and 60% weightage for the interview. The candidates can give up to two preferred specializations based on their eligibility conditions. Counseling for allotment of the specialization will be done online. Applicants are advised, from the date of announcement of first merit list, to check for e-mail communications from the Institute to learn about the admission status and steps they need to take to continue with the counseling process.

How to Apply

Candidates submit an online application by clicking on the link given on the Institutes website.

Admission Offer

Final merit list of confirmed and wait-list candidates based on their performance in the entrance examination/interview is posted in the website of the institute.

Important Dates

Online application website opens	February-March
Last date for submission of online applications	April-May
Interview for Non-Gate Applicants	June-July
Announcement of Merit List	June-July
Commencement of Classes	July

Fees Structure*

Tuition and Registration Fees: Rs. 67, 000 per Semester

Education Loan

The Institute will facilitate the students to avail educational loan from selected Banks. The bank officials will be present on campus at the time of registration of admitted students so as to enable the students to obtain details on procedures and terms and conditions of the loan. The students can also avail loan from banks of their choice and in either of the case; the Institute will extend support in completing the loan documentation process.

Financial Assistance

All GATE admitted students would be eligible for a monthly stipend of Rs. 12400/- in the form of Teaching Assistants in the first semester. In subsequent semesters, the continuation would depend on their satisfying the academic requirements.

For Inquiries: Voice Call: 080 66 91 91 80

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/**

Message to Prospective Students

The Post Graduate programme – MTech (ICT) with specialization in VLSI and Embedded systems is a unique fusion of foundation courses in Electronics with underlying intersection with machine learning, IoT, sensor networks, and exposure to the techniques, tools used in VLSI and Embedded systems to solve problems in related areas. The primary objective of this program is to produce Industry ready quality human resources with strong Analytical Skills to take up challenges in research activities, which are of national importance.

Dr. K. S. Dasgupta
Director

VLSI is an integral part of ICT. DAIICT has well equipped labs and well known faculty working in this exciting area and they are handling interesting projects. I am sure by joining DAIICT, you will gain abundant knowledge to build your career in this area. Hence, I strongly recommend you to join DAIICT and help us in taking this field to a greater height.

Dr. Manjunath Joshi
Dean (Research & Development)

The MTech (ICT) with specialization in VLSI and Embedded Systems has found a unique place among other specializations in the MTech program. Faculty involved in this specialization are highly experienced and committed to provide a strong foundation in the field, impart knowledge in industry relevance courses and a compulsory thesis training. The specialization attracts the best talents from different parts of the country because of our alumni who have been well appreciated in industry and in the society. I welcome all aspirants to take part of the journey of this specialized program.

Dr. Maniklal Das
Dean (Academic Programs)
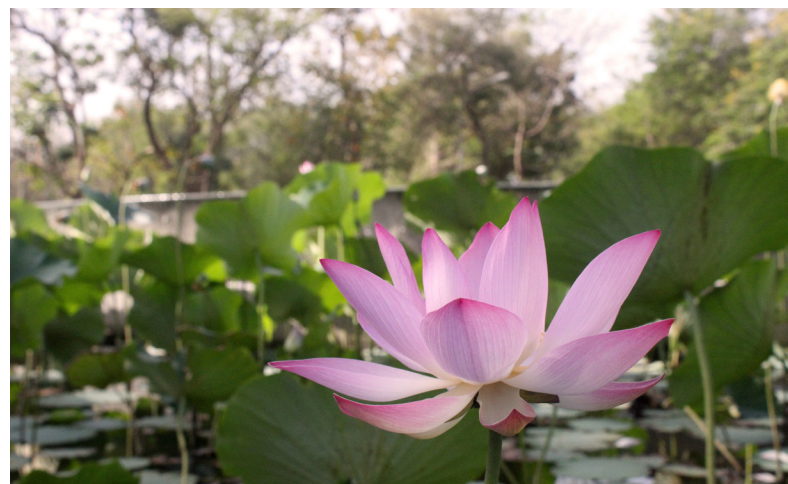
The Right Career
Where the Degree can Take you

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/

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,

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/

ORACLE
Linked in
THOROGOOD
Sapient
Cybage
aspiringminds
Employability Quantified
Directi
Intelligent People. Uncommon Ideas.
practo
ZS
ZS ASSOCIATES
Bit Mapper
Innovation Technologies Pvt. Ltd.
Deloitte.
hike
ishi systems
eInfochips
CAPILLARY
kuliza
Airvana
CIGNEX DATAMATICS
Making Open Source Work
OpsHub
Open-Silicon
airtel
Morgan Stanley
amazon.com
flipkart.com
Google
Infosys
interview street
JUNIPER NETWORKS
SAMSUNG
KiVi Technologies
virtual key to your health
YAHOO!
successfactors
An SAP Company
Evosys
Evolutionary Friendly Passionate
VERSE
saba
Goldman Sachs
Futures First
infibeam.com
MAQ Software
GRIT Technologies
Refine Your Business
nagarro
Mu Sigma
sprinklr
TATA
TATA CONSULTANCY SERVICES

Campus Life

DA-IICT is spread over 50 acres of land in Gandhinagar, Capital City of Gujarat. The DA-IICT campus is caringly 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.

RO PLANT

S

STP

L

VOLLEYBALL COURT

PLAY GROUND

BASKETBALL COURT

M

N

OPEN AIR THEATRE

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A

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PARKING

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E

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K

R

PARKING

DG ROOM

FOCAL POINT

T

SUB STATION

50 Acres Campus

GATE

W
S
N
E

DA-IICT
· Dhirubhai Ambani Institute of Information and Communication Technology ·