MSc. in Data Science

Dhirubhai Ambani Institute of Information and Communication Technology

DA-IICT

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 18 years and DAIICT 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) 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

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

Extra Mural Grant Few Tens of Crores for R&D

Institutional h-index : 31
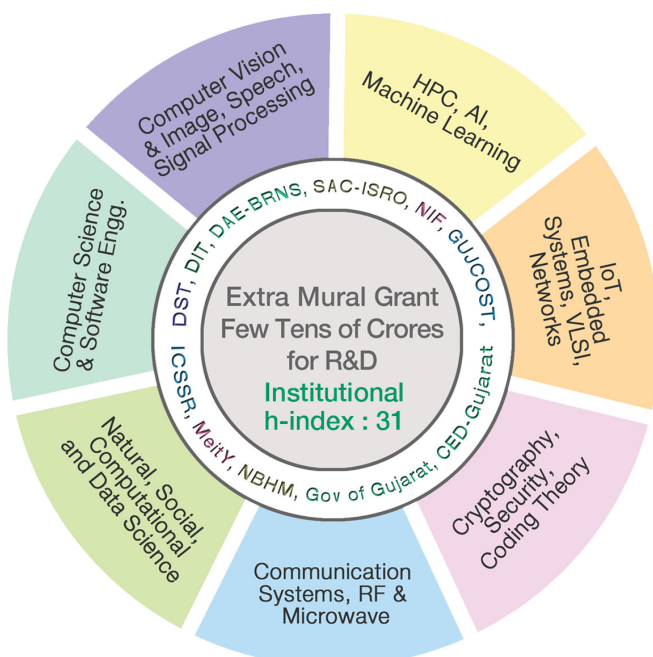
International Projects
NSF-USA, Indo-French, Indo-Spain

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

Data science is a discipline that incorporates varying degrees of Data Engineering, Scientific Method, Math, Statistics, Advanced Computing, Visualization, Hacker mindset, and Domain Expertise. The current era is becoming a digital space where each organization deals with large amounts of structured and unstructured data on a daily basis. Evolving technologies are leading to cost saving solutions for storage and analysis of such large data in all aspects of work and society including health care, finance, business, e-commerce, public safety, scientific discoveries, social sciences and public policy. According to the World Economic Forum (WEF), Data and AI will experience the highest annual growth rate for job opportunities, at 41%. As reported recently, with nearly 100,000 vacancies, India is the second biggest data analytics jobs hub after the US and demand for data science skill sets is increasing at a very fast pace.

The field of data science has witnessed an immense growth in recent years particularly due to the rise of the internet and social media. The exploration of data science by the business world initially started with analysis of business data and hence emphasis was given for financial data analytics. With the increase of multimedia data such as image, video, audio and text, each domain as mentioned above, many times needs to perform analysis of such multimedia big data. Hence the study of data science includes analysis of multimedia data along with other types of data such as business data and unstructured social media data. In our daily life, now we are capturing data from sources such as i) sensors used in various places like agricultural fields, shopping malls, ii) posts on social media, iii) digital images and videos captured in cell phones and iv) purchase transactions made through e-commerce. Analysis of such big data which could be multimodal in nature is a huge challenge. Modern technologies in the areas of artificial intelligence (AI) and machine learning (ML) are now extensively used to get insights of such big data. By the end of 2024, 75% of enterprises will shift from evaluating to operationalizing AI, driving a 5 folds increase in streaming data and analytics infrastructures.

With all these in mind, our new master's program in Data Science, not only includes traditional data analysis skills but also incorporates other crucial skills to perform multimedia and big data analysis. The courses focus on acquiring fundamental knowledge of mathematics, statistics and computer science. The curriculum also includes domain specific knowledge by incorporating courses in multimedia, business and finance. Techniques such as data processing, database management, machine learning along with tools such as Python, R and SAS are also included to enhance the technical and analytical skills. SAS based training imparted during the program encompasses building basic skills in analytical programming, advanced skills in data integration, machine learning, deep learning, artificial intelligence and big data visualization. SAS has a variety of tools and applications that are part of the curriculum which enables students with industry ready skills. The SAS based courses are offered in mini project, outcome-oriented workshop mode to make the students hands-on with the challenges of data science.

In summary the MSc in data science program will help the students to:

- Acquire a strong foundation in data management and analysis
- Develop decision making skills
- Demonstrate problem solving skills
- Use application of technology in Business
- Demonstrate a critical awareness of current issues in business
- Succeed in data-science related jobs

DA-IICT

The Dhirubhai Ambani Institute of Information and Communication Technology, Gandhinagar, seeks to invoke the wider vision of the late Dhirubhai Ambani and weave both knowledge and innovation as part of an evolving style.

We realize that the idea of information does not exhaust the possibilities of knowledge. We understand that knowledge that is relevant has to be understood as communication, information and meaning. We honour relevance by constantly reworking the idea of citizenship, leadership, innovation and responsibility. While global in vision, we seek to constantly repay the local hospitality of Gujarat as a site of world class institutions. DA-IICT was visualized as a research driven institute embodying the vision of India as a knowledge society. It was an intellectual experiment combining the twin segments of information and communication into a unified system called ICT.

This fundamental innovation combining the computer sciences and computer engineering was embedded in a large matrix of interdisciplinary subjects including Film, Animation, Design, Science Studies and Management along with the traditional Humanities and Social Sciences. This vision, we are proud to say goes beyond the traditional idea of Liberal Arts wedded to an engineering institute. It visualizes the student as a professional and as a citizen dealing with knowledge systems at large but with a core competence in a particular area.

SAS

SAS is the leader in analytics. Through innovative software and services, SAS empowers and inspires customers around the world to transform data into intelligence. SAS gives you THE POWER TO KNOW®.

SAS Education helps in building skills for some of today's most desired positions, such as data scientists and business analysts. Through our innovative software and services, we empower and inspire students and professionals around the world to transform data into intelligence.

SAS software has been part of education for four decades and is used at more than 3,000 educational institutions around the world. Skills in SAS (being a global leader since 1976) have a pay premium and incessant skills requirements in more than 110 countries . SAS collaborates with universities to bridge the talent gap by developing programs to meet growing needs. SAS course structures are aligned directly to job descriptions of the industry. SAS defines "data science" as "a multidisciplinary field that combines skills in software engineering and statistics with domain experience to support the end-to-end analysis of large and diverse data sets, ultimately uncovering value for an organization and then communicating that value to stakeholders as actionable results."

Master the skills you need to become a Data Scientist

Data Curation

AI & Machine Learning

Advanced Analytics
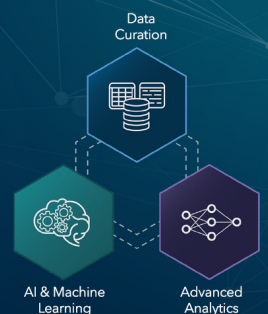
SAS® Academy for Data Science

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Characterization of the Program: Intersection of Mathematics, Statistics, Programming, Big-Data and Machine Learning

Uniqueness of the Program: Practice oriented and case study based program

The program primarily aims to cater to the following audience:

1. Traditional Science/ Economics/ Engineering Graduates with good mathematical aptitude, basic programming skills and inclination towards data science.
2. Professionals who are thinking about enhancing their skills in the field of data science.

Program Structure and Objective

The primary objective of the MSc. in Data Science program is to develop a skilled professional workforce that is prepared to address the increasing needs in the rapidly expanding area of big data analytics and data science. In the current era, for career progression, one needs to understand the language of data through analytical skill. Hence, it is absolutely necessary nowadays, to develop manpower with a skill to perform data analysis to get meaningful information from the data of different domains such as banking and finance, insurance, agriculture, healthcare, retail, education, social media, manufacturing, transportation, entertainment & so on.
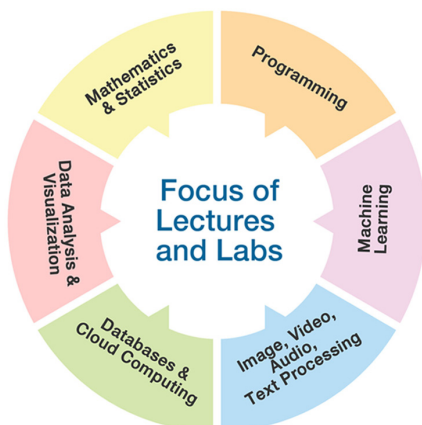
As students come from different academic backgrounds, it is important to get everybody up to speed and on the same level. To do so, we offer several foundation level courses in the first semester. In subsequent semesters, pedagogical approach focused on learning by doing is incorporated in the form of mini-projects and case-studies in addition to advanced courses.

The program relies on a wide range of teaching methods including lectures, tutorials, case study analysis, lab exercises, projects as well as extras throughout the year.

The one semester internship is designed to facilitate students' professional integration. It enables them to apply their newly acquired skills and knowledge to hands-on-experience as interns within an organization. There is also a provision for on-campus projects (under the supervision of faculty member(s)) instead of internships to support independent and individual research on a cutting-edge topic related to data sciences. Its objective is to provide students with a first complete and original research experience in relation to their internship.

SAS based courses/ training and a large number of practical case studies have been integrated in the program to boost the learner confidence and market acceptability. The program also enables the students to obtain SAS global certification in many fields and the skills can be ratified and showcased through SAS international certification badges.

Focus of Lectures and Labs: Mathematics & Statistics, Programming, Machine Learning, Image, Video, Audio, Text Processing, Databases & Cloud Computing, Data Analysis & Visualization

Program Outcome: Skills Developed: Analytical & Problem Solving Skills, Programming: Python and R, Data Modeling & Prediction, Multimedia Data Computation, Data Storage & Management, Data Visualization & Presentation

AUTUMN SEMESTER (Semester-1)

Course Name	Credits (L-T-P-C)
Mathematical Foundation for Data Science	4 Credits (3-1-0-4)
Data Structures and Algorithms *(Lab:Python)*	4 Credits (3-0-2-4)
Statistical Methods *(Lab:R)*	4 Credits (3-0-2-4)
Programming Lab	2 Credits (0-0-4-2)
- Introduction to Python and R	
- SAS-Essentials & Manipulation Techniques	
Introduction to Database Management	4 Credits (3-0-2-4)

WINTER SEMESTER (Semester-2)

Course Name	Credits (L-T-P-C)
Machine Learning	4 Credits (3-0-2-4)
Numerical Methods for Data Science	4 Credits (3-0-2-4)
Big-Data Processing	3 Credits (2-0-2-3)
SAS based Mini Project -1	2 Credits (0-0-4-2)
- Data Integration for Managers	
Optimization	3 Credits (2-0-2-3)
Technical Elective1	4 Credits (3-0-2-4)

AUTUMN SEMESTER (Semester-3)

Course Name	Credits (L-T-P-C)
Deep Learning	4 Credits (3-0-2-4)
Interactive Data Visualization	4 Credits (3-0-2-4)
Open Elective1	3 Credits (3-0-0-3)
Technical Elective2	3/ 4 Credits
SAS Based Mini Project 2	2 Credits (0-0-4-2)
- Neural Network Essentials	
- Deep Learning using SAS	
- Visual Text Analytics using SAS	
Domain Specific Mini Project	2 Credits (0-0-4-2)

WINTER SEMESTER (Semester-4)

On-Campus Projects / Industry Internship

WINTER BREAK

- MACRO & SQL Programming for Data Science in SAS
- Introduction to SAS & HADOOP

SAS Certification Exam – I
(SAS Certified Specialist: Base Programming Using SAS)

SUMMER BREAK

- BIG DATA Visualization – Essentials and Advanced
- Statistical Inference and Modeling using SAS
- Applied MACHINE LEARNING using SAS

SAS Certification Exam – II
(SAS Certified Data Integration Developer for SAS)

SAS Certification Exam - III
(SAS Certified Specialist: Machine Learning Using SAS)

WINTER BREAK

- Visual Forecasting using SAS
- Optimization Concepts for Data Science and Artificial Intelligence

SAS Certification Exam - IV
(SAS Certified Specialist: Natural Language Processing and Computer Vision Using SAS VIYA)

SAS Certification Exam – V
(SAS Certified Specialist: Forecasting and Optimization Using SAS VIYA)

Technical Electives in the areas of

- Image Processing
- Speech Processing
- Computer Vision
- Natural Language Processing
- Financial/ Business Data Analysis
- Information Retrieval
- Social Media Analytics
- Security
- Cloud Computing
- Data Warehousing and Data Mining

Total seats: 60
Eligibility Criteria

- A Bachelor's degree in Science (BSc/BCA) from a recognized University with an aggregate of 60% or its equivalent as per the norms set by the degree granting institute/university in Statistics, Mathematics, Physics, Computer Science, Economics, Operational Research or IT OR
- A Bachelor's degree in Engineering or Technology from a recognized University with an aggregate of 60% or its equivalent as per the norms set by the degree granting institute/university in Computer Science, Information Technology, Electronics, Electronics & Communication or Electrical Engineering.

Selection Process

The candidates are selected through an entrance test conducted at selected centers all over the country. The tentative list of centers is: Gandhinagar, Ahmedabad, Bhopal, Benguluru, Chennai, Mumbai, Hyderabad, Patna, Jaipur, Kolkata, New Delhi, Pune, Rajkot, Surat and Udaipur.

The candidates will be called for an interview on the basis of their performance in the entrance test.

Entrance Test: The test evaluates the candidates on their mathematical aptitude, logical reasoning, and basic programming.
Pattern: Multiple Choice Question (MCQ). Syllabus and sample question papers are available on the institute website.

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 on the website of the Institute.

Important Dates

Online application website opens	February-March
Last date for submission of online applications	April-May
Entrance test	June
Announcement of Merit List	June-July
Commencement of Classes	July

Fees Structure*

Tuition fee: Rs. 1,75,000 per Semester **

** Tuition Fee includes the cost of on-campus SAS based training to be imparted primarily during winter/ summer breaks by Faculty from SAS/ industry experts and one attempt of 5 global certifications in the framework of SAS – DA-IICT academic partnership.

Education Loan: The Institute will facilitate the students to avail educational loan from selected Banks.
Financial Support: The Institute will award a limited number of Merit-Cum-Means Scholarships to the admitted students based on their academic performance and annual income of their parent(s)/guardian(s). The Financial Assistance to the students shall be as per DA-IICT norms.

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 primary goal of this "One-of-a-Kind" truly multidisciplinary Post Graduate programme – MSc in Data Science is that each student will have (i) strong academic foundations in Computer Science related to Data Science, Statistics and Machine Learning, (ii) required industry ready technical skills with Global Certification from SAS to handle the challenges of data analysis spectrum ranging from asking an interesting question to acquiring, managing, analysis and visualization.
Dr. K. S. Dasgupta
Director

Our MSc.in DS program educates our students about how data science is changing our everyday life. We impart the right skills and training in maths, stats, programming, AI and domain knowledge to prepare the students for this new revolution. Join us to learn how to make a more comprehensive and complete picture of the world using data.
Dr. Bhaskar Chaudhury
Associate Dean (Academic Programs)
and MSc.-DS Program Coordinator

The Master of Science in Data Science program prepares graduates with strong foundational knowledge and industry relevant skills, mentored by experienced faculty and subject matter experts. I invite aspirants to join, learn and explore this enriching program, and become a successful professional in Data Science and Analytics.
Dr. Maniklal Das
Dean (Academic Programs)

By choosing our Data science program, I am sure you will gain expertise in the area and work on real world problems. I strongly encourage you to apply and pursue your MSc-DS from DAIICT.
Dr. Manjunath Joshi
Dean (Research & Development)

DAIICT has been in the forefront in innovating academic programs. Introducing ICT programs at UG level was an innovation in 2002. The Data Science program at PG level is a step in the same direction. Not many peer institutes have similar programs.The students will appreciate it because of its industry orientation. Wish all the success.
Dr. Ranendu Ghosh
Dean (Students)

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/

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
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STP
VOLLEYBALL COURT
PLAY GROUND
BASKETBALL COURT
M
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OPEN AIR THEATRE
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I
F
D
J
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Q
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PARKING
PARKING
PARKING
DG ROOM
FOCAL POINT
R
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SUB STATION
GATE
50 Acres Campus

W
S
N
E

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Institute of Information and Communication Technology

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