



INDIA RANKINGS 2020

**170**

**IARE IS NIRF RANKED  
INSTITUTION**

# Computer Science and Engineering

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# Emerging Areas

*To Understand is  
To Invent..*



**IARE**

Institute of Aeronautical Engineering

An **Autonomous** Institute  
**NAAC** Accreditation with 'A' Grade  
Accredited by **NBA**  
Permanent Affiliation Status from **JNTUH**



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## RANKINGS AND ACCOLADES

Quality does not depend on high tuition fee. It banks on academic excellence, dedicated faculty and passionate student community. We are proud to say that at IARE International Quality Education is offered at an affordable fee.

**Experience more at IARE!!!**

It is a matter of great pride that the institute is ranked one among the 200 best engineering colleges in the country by the National Institutional Ranking Framework (NIRF) - 2020, Ministry of Human Resources Development, Govt. of India.



**MHRD**

Govt. of India.  
Ministry of Human Resource Development



**INDIA RANKINGS 2020**

IARE is ranked **170** in Engineering category as per National Institutional Ranking Framework (NIRF) – 2020. Ministry of Human Resource Development (MHRD), Govt. of India.

**This illustrates positive performance and quality standards we maintain in teaching, research, employability, and innovation.**



IARE's ratings as given by the most read and widely acclaimed magazines:

- | **Careers360 (AAA+)**
- | **India Today (50)**
- | **The Week (89)**
- | **Times of India (15)**
- | **Competition Success Review (27)**
- | **BW Business World (51-65)**

## DIFFERENCES AND SIMILARITIES AMONG CSE / IT / CSIT / AI & DS / CSE & BS / CSE (CS)

	Computer Science and Engineering	Information Technology	Computer Science and Information Technology
<b>What is it basically?</b>	Computer Science is the study of the theory, design, implementation, and performance of computer software and computer systems, including the study of computer-based devices.	Information Technology is the study of processing, transmitting, administering and storing of information and databases. Information Technology build communication networks, safeguard data, information and help to troubleshoot problems with computers or mobile devices.	Computer Science and Information Technology provides a realistic balance between theoretical understanding of computation and how to build the secure databases and systems.
<b>Who They Are?</b>	Technology Designers and Developers	Technology Implementers and Practitioners	Technology Designers and Implementers
<b>Where do they get placed?</b>	Computer Software Engineer; Software Analyst; Programmer; Database Administrator; Systems Architect; DevOps Engineer	IT consultant; Cloud Architect; Mobile Specialist; Web Developer; Vendor Manager; System Administrator	Computer Systems Analyst; Security Architect; Web Developer; Cloud Architect; Systems Manager; Information Technology Consultant;
<b>Required Courses</b>	Programming for Problem Solving; Object Oriented Design and Programming; Data Structures; Discrete Mathematical Structures; Computer Organization; Theory of Computation; Operating System; Artificial Intelligence; Design and Analysis of Algorithms; Database Management Systems and Data Warehouse; Language Processing; Software Engineering; Computer Networks; Data Analytics and Mining; Web Technologies		
<b>Focused Courses</b>	<ul style="list-style-type: none"> <li>• High Performance Computing</li> <li>• Computer Ethics, Society and Technology</li> <li>• Angular JS</li> </ul>	<ul style="list-style-type: none"> <li>• Microcontrollers and Interfacing</li> <li>• Computer Ethics: Society and Technology</li> <li>• ASP.NET through C#</li> <li>• Internet of Things</li> </ul>	<ul style="list-style-type: none"> <li>• Microcontrollers and Interfacing</li> <li>• Machine Learning</li> <li>• Information Security</li> <li>• Cloud Computing</li> </ul>
<b>Elective Courses</b>	<p><b>Artificial Intelligence and Data Science -</b></p> <ul style="list-style-type: none"> <li>• Natural Language Processing</li> <li>• Intelligent Agents</li> <li>• Cyber Physical System</li> <li>• Scalable Systems for Data Science</li> <li>• Information Retrieval</li> </ul> <p><b>Network-Centric Security-</b></p> <ul style="list-style-type: none"> <li>• Advanced Computer Networks &amp; Security</li> <li>• Cyber Physical System</li> <li>• Web Security</li> <li>• Mobile Application Security &amp; Penetration Testing</li> <li>• Cyber Laws</li> </ul>	<p><b>Artificial intelligence and Cognitive Computing-</b></p> <ul style="list-style-type: none"> <li>• Natural Language Processing</li> <li>• Intelligent Agents</li> <li>• Cyber Physical System</li> <li>• Brain Computer Interfacing</li> <li>• Pattern Recognition</li> </ul> <p><b>Business Intelligence and Information Architecture-</b></p> <ul style="list-style-type: none"> <li>• Introduction to Information Security</li> <li>• System Analysis and Design</li> <li>• Business Intelligence</li> <li>• Network Security Administration</li> <li>• Social Issues and Ethics in Computing</li> </ul>	<p><b>Artificial intelligence and Cognitive Computing-</b></p> <ul style="list-style-type: none"> <li>• Natural Language Processing</li> <li>• Intelligent Agents</li> <li>• Cyber Physical Systems</li> <li>• Brain Computer Interfacing</li> <li>• Pattern Recognition</li> </ul> <p><b>Data Science and Analytics -</b></p> <ul style="list-style-type: none"> <li>• Scalable Systems for Data Science</li> <li>• Computer Vision</li> <li>• Internet of Things</li> <li>• Advanced Social Text and Media Analytics</li> <li>• Information Retrieval</li> </ul>

## DIFFERENCES AND SIMILARITIES AMONG CSE / IT / CSIT / AI & DS / CSE & BS / CSE (CS)

	Artificial Intelligence and Data Science	Computer Science & Engineering and Business Systems	Computer Science and Engineering (Cyber Security)
<b>What is it basically?</b>	Artificial Intelligence and Data Science are two complementary areas of Intelligent Systems, with data science focusing on statistical techniques and artificial intelligence on algorithmic techniques.	The Business and Computer Science combined will give the technical background and understanding to apply IT solutions in a business context and use them to develop opportunities for growth of business.	Cyber Security combines work in computer science and mathematics with a security-driven focus, essential to find creative, effective solutions to issues of security and information assurance as internet has brought the threat of cyber-terrorism, attacks on critical installations and the misuse of social media.
<b>Who They Are?</b>	Data and Intelligence Analyst	Digital Marketing and Business Analyst	Security Engineer / Architect and Forensic Investigator
<b>Where do they get placed?</b>	Business Analyst; Data Analyst; Intelligence Analyst; Data Manager; Information Security Analyst; Risk Analyst.	Digital Advertising Analyst; Digital Marketing Analyst; IT Systems / Business Analyst; Social Media Specialist; Systems Designer; Business Systems Designer;	Incident Analyst / Responder; Security Analyst; Penetration and Vulnerability Tester; Forensic Investigator; Security Consultant; Security Engineer / Architect
<b>Required Courses</b>	Programming for Problem Solving; Object Oriented Design and Programming; Data Structures; Discrete Mathematical Structures; Computer Organization; Theory of Computation; Operating System; Artificial Intelligence; Design and Analysis of Algorithms; Database Management Systems and Data Warehouse; Language Processing; Software Engineering; Computer Networks; Data Analytics and Mining; Web Technologies		
<b>• Focused Courses</b>	<ul style="list-style-type: none"> <li>• Neural Networks and Deep Learning</li> <li>• Speech and Image Processing</li> <li>• Augmented Reality and Virtual Reality</li> <li>• Statistical Modelling</li> </ul>	<ul style="list-style-type: none"> <li>• Statistical Modelling</li> <li>• Digital Marketing</li> <li>• Big Data and Business Analytics</li> <li>• Machine Learning</li> </ul>	<ul style="list-style-type: none"> <li>• Cryptography &amp; Network Security</li> <li>• Cyber Security</li> <li>• Ethical Hacking &amp; Network Defence</li> <li>• Digital Forensic</li> </ul>
<b>Elective Courses</b>	<p><b>Artificial Intelligence and Cognitive Computing-</b></p> <ul style="list-style-type: none"> <li>• Natural Language Processing</li> <li>• Intelligent Agents</li> <li>• Cyber Physical System</li> <li>• Brain Computer Interfacing</li> <li>• Pattern Recognition</li> </ul> <p><b>Data Science and Analytics -</b></p> <ul style="list-style-type: none"> <li>• Scalable Systems for Data Science</li> <li>• Computer Vision</li> <li>• Internet of Things</li> <li>• Advanced Social Text and Media Analytics</li> <li>• Information Retrieval</li> </ul>	<p><b>Business Management Systems-</b></p> <ul style="list-style-type: none"> <li>• Human Resource Management</li> <li>• Organizational Behaviour</li> <li>• Financial &amp; Cost Accounting Modelling</li> <li>• Marketing Research &amp; Management</li> <li>• Innovation, IP Management and Entrepreneurship</li> </ul> <p><b>Business Intelligence-</b></p> <ul style="list-style-type: none"> <li>• Neural Network and Deep learning</li> <li>• Predictive Analytics</li> <li>• Advanced Social, Text and Media Analytics</li> <li>• Information Retrieval System</li> <li>• Scalable Systems for Data Science</li> </ul>	<p><b>Network-Centric Security-</b></p> <ul style="list-style-type: none"> <li>• Advanced Computer Networks &amp; Security</li> <li>• Cyber Physical System</li> <li>• Web Security</li> <li>• Mobile Application Security &amp; Penetration Testing</li> <li>• Cyber Laws</li> </ul> <p><b>Machine Intelligence-</b></p> <ul style="list-style-type: none"> <li>• Intelligent Agents</li> <li>• Neural Networks &amp; Deep Learning</li> <li>• Ethical Hacking</li> <li>• Brain Computer Interfacing</li> <li>• Natural Language Processing</li> </ul>

## 1. COMPUTER SCIENCE AND ENGINEERING

Computer Science refers to the processes used to create computer programs and applications along with the theory behind them. Computer science involves learning about programming which includes learning the basics of programming, algorithms, data structures and complexity theory. Computer engineering deals with the 'low level' and involves the internal circuitry, electronics and power of a computer. The level above computer engineering is wide, as it deals with both the low level of computer engineering and the high level programming which integrates chips and circuitry.



The work of people in the computer science field falls into three categories, which include designing and implementing software, devising new ways to use computers, and developing effective ways to solve computing problems.

### Skills Gained:

- Deep knowledge of algorithms and data structures, and coding skills in languages like C, Java Python and open source technologies.
- Analytical approach to create the code for automatic complex process and solve problems.
- Design, implement, and evaluate computer-based systems, services and applications employing the methods of software engineering as an instrument to ensure quality.

### Job Opportunities:

- Software Developer
- Computer Software Engineer
- Software Analyst
- programmer
- Database Administrator
- Systems Architect

## 2. INFORMATION TECHNOLOGY (IT)

Information Technology refers to the application of technology to solve business processes. IT deals with management of computers rather than computation. IT is a combination of programming, hardware administration, software administration, networking and network security. The Information Technology program focuses on programming, databases, networking, human-computer interaction, web systems, and cybersecurity to meet the technology requirements of business, government, health care, education, and other organizations.



IT is the subject area concerned with all aspects of managing and processing information. It is concerned with more than just computers and networks and relates to all layers/systems within an organization. Information Technology is essential to the operation and success of all business functions within a company.

### **Skills Gained:**

- Complete projects using relevant information technologies.
- Develop/maintain/test business support and IT systems.
- Project management skills including documentation and presentations for completion of project with varying complexities/durations.
- Identify priorities, manage multiple projects and meet deadlines.
- Designing and building systems that will meet the needs of consumers today and in the future.

### **Job Opportunities:**

- IT Consultant
- Cloud Architect
- Mobile Specialist
- Web Developer
- Vendor Manager
- System Administrator

## 3. COMPUTER SCIENCE AND INFORMATION TECHNOLOGY (CSIT)

Computer Science and Information Technology provides a realistic balance between theoretical understanding of computation and how to build the secure databases and systems. The Computer Science will be more involved with algorithm formulation, software development and implementation, while the Information Technology will likely find a career in web development, system administration, computer security, user support, etc.



The work of CSIT people is to interact with people from all organizational functions in designing and implementing computer applications. Computer Science and Information technology can take together with the major in Computer Science / Information Technology (double major), or another minor of choice.

### Skills Gained:

- Deep knowledge of algorithms and data structures, and coding skills in languages like C, Java Python and open source technologies.
- Analytical approach to create the code for automatic complex process and solve problems.
- Design, implement, and evaluate computer-based systems, services and applications employing the methods of software engineering as an instrument to ensure quality.
- Designed and build systems ranging from a small business needing a new technology tool, to managing the many and varied IT resources in a big business.

### Job Opportunities:

- Computer Systems Analyst
- Security Architect
- Web Developer
- Cloud Architect
- Computer and Information Systems Manager
- Information Technology Consultant
- Mobile Application Developer

## 4. ARTIFICIAL INTELLIGENCE AND DATA SCIENCE (AI & DS)

Wonder how Netflix predicts what its customers will enjoy? Wonder how health applications in your mobile devices are predicting your medical conditions? Wonder how your virtual assistants like Google, Siri and Alexa can do your daily work for you? Soon, your car will be able to drive itself faster and safer while you relax in the seat, but how?



That's where AI&DS will come in to play to teach the above situations, learn how they work and generate the best results while building some fascinating models.

With massive computational power, big data, artificial intelligence and machine learning systems will manage, analyse and use the data far more successfully than ever before.

This program combines two key areas of artificial intelligence and data science which are two complementary areas of Intelligent Systems, where Data science focusing on statistical techniques and Artificial Intelligence on algorithmic techniques. Both areas are in high demand in the tech industry and for Industry 4.0.

Data science and Artificial Intelligence jobs are amongst the best paid in the IT sector with both skills in ever increasing demand.

### Skills Gained:

- Create Expert Systems – The systems which exhibit intelligent behaviour, learn, demonstrate, explain, and advice its users.
- Implement Human Intelligence in Machines – Creating systems that understand, think, learn, and behave like humans Knowledge of computer science concepts in automation and specialist skills in artificial intelligence.
- Data science provides meaningful information based on large amounts of complex data or big data.
- Extract insights from data and report the results in data-analytic contexts.

### Job Opportunities:

- Business Analyst
- Data Analyst
- Intelligence Analyst
- Data Manager
- Information Security Analyst
- Risk Analyst

## 5. COMPUTER SCIENCE AND ENGINEERING & BUSINESS SYSTEMS

Business Systems are sets of connected procedures that include the analysis and organization of business information through the application of technology. All businesses contain information related to their products and internal structure. With this course, students will learn how to comprise this business information through technology. Students will learn how to formulate and develop business-strategic plans while aligning information system principles with business strategies.



The business environment has changed dramatically over the last decade through globalisation, an explosion in information and smart systems and global connectivity. The nature of information management has changed from that of creating systems from first principles to cloud based globalized systems that can handle and process vast amount of data ubiquitously.

### Skills Gained:

- A sound understanding of dynamics of industry, government and global business specific knowledge and expertise in business information systems.
- Learn to use IT management skills to help improve business efficiency and sharpen a company's competitive edge.
- Build to help tomorrows business managers to get equipped for digital transformation, plan strategically and redesign business secure operations as well as establish business processes and direct digitalization in big and small companies.

### Job Opportunities:

- IT Systems / Business Analyst
- Social Media Specialist
- IT Project Manager
- Systems Designer
- Business Systems Designer
- Business and Systems Analyst
- Business Data Analyst
- Digital Advertising / Marketing Analyst

## 6. COMPUTER SCIENCE AND ENGINEERING (CYBER SECURITY)

Cyberspace is a domain generated from the interconnection of computers and telecommunication networks around the world. It is used to store, modify, and exchange data via networked and related physical structures globally, regardless of physical geography. India has seen many attacks on its critical installations and the misuse of social media and internet has brought home the threat of cyber-terrorism, which cyber security experts say the country is poorly equipped to handle. A major challenge to cyberspace is security.



The Cyber Security program focuses on technology, people, information, and processes to enable assured cyber operations in the context of adversaries. The program is built on a technical foundation of computing and information technology.

### Skills Gained:

- Build skills related to cyber threat intelligence, digital forensics and risk management technology environment.
- In-depth knowledge of penetration testing, cyber forensics, malware reverse engineering and software vulnerability.
- The socio-ethical and legal aspects of cyber Security.
- Analyse and Identify new and existing cyber-attacks and determine methods to mitigate them.

### Job Opportunities:

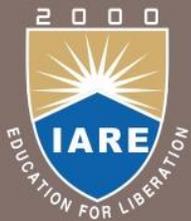
- Security Programmer
- Security Analyst
- Penetration and Vulnerability Tester
- Forensic Investigator
- Security Consultant
- Malware Analyzer
- Information Security Manager



It's our time to give  
life to earth

**Help Earth.**

**Save yourself**



## **Institute of Aeronautical Engineering (Autonomous)**

Approved by AICTE | NAAC Accreditation with 'A' Grade | Accredited by NBA | Affiliated to JNTUH, Hyderabad

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