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**College of Engineering, Guindy**
**Anna University, Chennai-600 025.**

# M.Sc.(Integrated) - 5 year

## Computer Science / Information Technology

## INFORMATION BROCHURE

## About the CEG

The College of Engineering, Guindy (CEG) in Chennai, is India's oldest engineering and technical institution, which was established in 1794. Today, it is one of the four constituent colleges of Anna University and one of the most prestigious and highly reputed Engineering College in the country along with the Indian Institutes of Technology.

It was started in May 1794 as a School of Survey and established as a college in 1859 under the Madras University, and is one of the oldest technical institutes in the world. The institution introduced B.E. Degree Courses in Mechanical Engineering in 1894, Electrical Engineering in 1930, Telecommunication and Highway Engineering in 1945, Printing Technology in 1983 and Geoinformatics in 1992. It was the first institution in South India to establish a Computer Centre in 1963.

The students are popularly called CEGians. It is ranked as one of the top engineering colleges in India. It has link-ups with institutions and organizations like USAID, UNCHS, Ford Foundation, European Economic Community and the Governments of Germany and UK. It was the first college in the country to have its own postage stamp when the Indian Postal Service brought out a postage stamp to mark the 200th anniversary of the institution.




## About the Department of Mathematics

The Department of Mathematics is one of the largest units of Anna University, catering to the needs of the Under-Graduate and Post-Graduate programmes in Science, Engineering and Technology. In 1975, the department started an exclusive M.Sc. programme in Mathematics. In 1979, it introduced research programmes leading to M.Phil and Ph.D in Mathematics. Subsequently in 1993, it started M.Sc. Mathematics with Diversification in Computer Science, which was renamed as M.Sc. (Computer Science) in 1997. Since 2001, it has been offering Five-year Integrated M.Sc. Programmes in Computer Science and Information Technology.

## Objectives of the Department

- To provide strong Mathematical background to Engineering students to cope with the needs of emerging technology at National and International levels.
- To provide basic and advanced skills to students in Computer Science and Information Technology enabling self-reliance and excellence in capabilities.
- To enable the students to play a vital role in the fields of Computer Science and Mathematics at the local level and to remain globally competitive.
- To create computer softwares and mathematical models to cater to the growing needs of Industries/Research establishments.
- To undertake significant research projects individually and in collaboration with other Departments / Institutions / Industries.
- To popularize and project the scope of Mathematics and Computer Science in proper perspective and attract young talents to take up teaching and research careers in Computer and Mathematical Sciences.

## About the Programmes

Anna University introduced the M.Sc. (Integrated) 5 year programmes in Computer Science / Information Technology in the year 2001 which have been well received by the software industries across the globe. Under the autonomous scheme of the Department of Mathematics, these ten semester programmes were introduced with the aim of training the students to apply skills acquired by them in the fields of Computer Science and Information Technology. The highlight of this programme is that the students should undergo full time project work for a duration of six months in their 7$^{th}$ semester in leading software industries with attractive stipend. This is a unique feature of this programme as compared to B.E. programmes. The project will help the students to understand the subjects to a level where they could formulate and solve real life problems. Furthermore, this provides an adequate preparation for taking up more challenging projects in the 10$^{th}$ semester. Such an exposure has increased the students' level of participation in innovative application oriented projects from real life situations and has enabled them to develop team building and decision making skills and also to adapt to various uncertain situations. The curriculum has been structured in such a way that the students get good understanding of the system, software design and development.

## Eligibility

A pass in the HSC (Academic), in the first appearance itself, with Mathematics, Physics and Chemistry as three of the four subjects of study. The candidate must have scored a minimum average mark set by the University as per Government norms.



## Course Structure

The following is the Course Structure for M.Sc. (Integrated) 5 year Computer Science / Information Technology as per the regulation 2010.

### M.Sc. (Integrated) 5 year - Computer Science

**Semester 1**

**Theory**
- Communicative English
- Mathematics-I
- Fundamentals of Computer Science
- Applied Physics
- Chemistry of Materials

**Practical**
- Communication Skills Laboratory (Language)
- Fundamentals of Computing Laboratory

**Semester 2**

**Theory**
- Technical Communication
- Mathematics-II
- Programming in C
- Circuit Theory
- Digital Systems

**Practical**
- C Programming Laboratory
- Digital Systems Laboratory
- Business Data Processing Laboratory

**Semester 3**

**Theory**
- Mathematics-III
- Discrete Mathematics
- Data Structures
- Object Oriented Programming
- Computer Organization
- Database Management Systems

**Practical**
- Data Structures and Object Oriented Programming Laboratory
- Database Management Systems Laboratory

**Semester 4**

**Theory**
- Microprocessors and Applications
- Principles of Communication
- Java and Internet Programming
- Operating Systems
- Combinatorics and Graph Theory

**Practical**
- IC and Microprocessors Laboratory
- Operating Systems Laboratory
- Java and Internet Programming Laboratory

**Semester 5**

**Theory**
- Probability and Statistics
- Computer Networks
- System Software
- Software Engineering
- Visual Programming
- Cryptography and Data Security
- Elective I

**Practical**
- System Software Laboratory
- GUI Applications Laboratory

**Semester 6**

**Theory**
- Operations Research
- Object Oriented Analysis and Design
- Network Programming
- Web Technology
- Environmental Science and Engineering
- Elective II

**Practical**
- Network Programming Laboratory
- Web Technology Laboratory (J2EE)
- Case Tools Laboratory

**Semester 7**
- Project work

**Semester 8**

**Theory**
- Numerical Methods
- Theory of Computation
- Mobile Communication
- Computer Graphics and Multimedia
- Elective-III
- Elective-IV

**Practical**
- Computer Graphics and Multimedia Laboratory
- Open Source Software Laboratory (Mini Project)

**Semester 9**

**Theory**
- Principles of Compiler Design
- Principles of Management
- Software Testing & Quality Assurance
- Service Oriented Architecture
- Elective-V
- Elective-VI

**Practical**
- Software Testing Laboratory
- Service Oriented Architecture Laboratory

**Semester 10**
- Project work



## M.Sc. (Integrated) 5 year - Information Technology

**Semester 1**

**Theory**
- Communicative English
- Mathematics-I
- Fundamentals of Computer Science
- Applied Physics
- Chemistry of Materials

**Practical**
- Communication Skills Laboratory (Language)
- Fundamentals of Computing Laboratory

**Semester 2**

**Theory**
- Technical Communication
- Mathematics-II
- Programming in C
- Business Data Processing
- Digital Systems

**Practical**
- C Programming Laboratory
- Digital Systems Laboratory
- Business Data Processing Laboratory

**Semester 3**

**Theory**
- Mathematics-III
- Discrete Structures
- Data Structures
- Object Oriented Programming
- Computer Organization
- Database Management Systems

**Practical**
- Data Structures and Object Oriented Programming Laboratory
- Database Management Systems Laboratory

**Semester 4**

**Theory**
- Advanced Databases
- Principles of Communication
- Java and Internet Programming
- Operating Systems
- Design and Analysis of Algorithms

**Practical**
- Advanced Databases Laboratory
- Operating Systems Laboratory
- Java and Internet Programming Laboratory

**Semester 5**

**Theory**
- Probability and Statistics
- Computer Networks
- .NET Programming
- Software Engineering
- Visual Programming
- Cryptography and Data Security
- Elective I

**Practical**
- .NET Programming Laboratory
- GUI Applications Laboratory

**Semester 6**

**Theory**

- Operations Research
- Object Oriented Analysis and Design
- Network Programming
- Web Technology
- Environmental Science and Engineering
- Elective II

**Practical**

- Network Programming Laboratory
- Web Technology Laboratory (J2EE)
- Case Tools Laboratory

**Semester 7**

- Project work

**Semester 8**

**Theory**

- Numerical Methods
- Software Project Management
- Mobile Communication
- Computer Graphics and Multimedia
- Elective-III
- Elective-IV

**Practical**

- Computer Graphics and Multimedia Laboratory
- Open Source Software Laboratory (Mini Project)

**Semester 9**

**Theory**

- Enterprise Computing
- Principles of Management
- Software Testing & Quality Assurance
- Service Oriented Architecture
- Elective-V
- Elective-VI

**Practical**

- Software Testing Laboratory
- Service Oriented Architecture Laboratory

**Semester 10**

- Project work



**Electives**

- Bioinformatics
- Information Coding Techniques
- Geographic Information System
- Digital Signal Processing
- Wavelet Analysis
- Embedded Systems
- Fault Tolerant Systems
- Software Metrics
- Computation Complexity
- Personal Software Processes
- High Speed Networks
- Pattern Recognition
- Performance Evaluation of Systems and Networks
- Modelling and Simulation
- Digital Image Processing
- Data Warehousing and Mining

**Note:** The Course structure is subject to change as per the regulation. Based on the industry requirements electives will be added.

## Faculty

The Department of Mathematics is committed to develop quality Mathematicians and software professionals by providing concept oriented subject knowledge through high quality teaching supplemented with practical training.

The Department has a galaxy of dedicated, well qualified and research oriented faculty members. Many of them are having doctoral degrees and others are in the process of pursuing their Ph.D degree. The department is always striving hard to create and nurture scientific ideas in the young minds.

The Department is committed to create a culture that encourages excellent teaching, technological innovation and exploration of the latest advances in the rapidly changing fields of Mathematics, Computer Science and Information Technology. Presently our Department has been internationally recognized for high quality research in foundational, applied or interdisciplinary areas.

## Internship

As a part of the curriculum, the students are required to undergo a full-time industrial internship project training during their seventh (July-December) and final (January-May) semesters. During this period, the students get an opportunity to obtain a hands-on experience and also knowledge about what the industries expect from them. The industrial exposure gained by the students during these semesters makes them aware of the cutting-edge technology used in industries, the ethical code they are expected to follow in the companies and also provides them an opportunity to acquire soft skills.

Most of the students do their internships in companies which include **Caterpillar, Cisco, Cognizant, eBay, Force10 Networks, HCL, Hexaware, HeyMath!, Intel, Morgan Stanley, Mu Sigma, Nokia Siemens, Sagitec, Symantec, TCS, Texas Instruments, Thorogood Associates, Wipro, Oracle** and they are generally paid attractive stipend by the recruiting firms during the internship period.

## Extra Curricular Activities

The M.Sc. (Integrated) course on Information Technology/Computer Science helps the students to develop their academic skills and also paves way for them to be active participants in extra-curricular activities conducted to develop the individual talents of every student. The Math Computing Society (MCS) which was started by the earnest efforts of the students with able guidance from the staff helps the students conduct various beneficial activities. Lectures by eminent personalities, Seminar talks, student personality development activities such as Group discussions, Quiz Programmes and Workshops conducted on new and developing technologies have all been a part of the activities conducted by MCS. Right from the time of a very inspiring start, MCS, with able guidance and support from the faculty, has never ceased to work for the development of the students and has achieved great support and enthusiasm from the students. The MCS releases CRUX, a newsletter released every semester with the articles and information on the recent trends collected and edited by the students with the guidance of the faculty members. The MCS also has its own website (http://www.mcs-au.in) developed and maintained by the students. The site has various features like blog, chat room, forum and resources like e-books etc., which the students from all batches can utilize and share.



This course, as mentioned, functions under the Department of Mathematics and hence, the students of M.Sc. (CS/IT) take pride in working for the National level Symposium, MATHRIX, conducted by the Department every year. The students get trained in organising the technical events and this event has received a great response from students of various universities and colleges.

Apart from the MCS, organised and managed specially for the Department of Mathematics students, there are a number of other societies such as the Computer Society of Anna University (CSAU), Students Quality Club (SQC), Rotaract club, Robotics club, Green Brigade, Leo club, Literary club, Guindy Times of Anna University and many others to the list.

Being a student of Anna University also lets the student take active participation in one of the personality development programmes which includes the NSS (National Service Scheme), NCC (National Cadet Corps), NSO (National Sports Organisation) or YRC (Youth Red Cross)

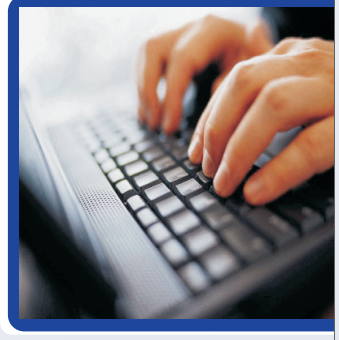
The students are also encouraged to take active participation in the events organised by other colleges and universities and our great minds emerge as the winners giving a tough competition to all the other participants. The students are also taken for industrial visits which introduce them to the real industrial world.

## Computing Facility

The Department meets the students' computing needs by providing the following facilities: two highly sophisticated Computer Laboratories consisting of 140 computers, with one located in the Main building and the other in the CPDE building of the CEG Campus. The labs are well equipped, with latest softwares installed in all the computers and with power backup facility. The students are allowed to access these computing facilities available within the Department and the University. The students can also make use of the Ramanujan Computing Centre (RCC) in the University which hosts nearly 300 computers. The students are always encouraged to access these facilities and these computing facilities including the RCC are functioning as a technology provider to students and researchers to fulfill their computational, technological and internet requirements.

## Internet Facility

The technology is developing every minute and it is vital that the students keep track of these fast developing issues especially in the software field. Hence, the RCC provides an Internet service with wider bandwidth of 70 Mbps and 1 Gbps from NKN for Ministry of Human Resource Development. Fiber backbone establishes strong connectivity in every nook and corner of the vast campus. Wi-Fi facility has been provided in the campus with which the students can access the internet anywhere in the campus.





## Library Facility

Books are always the best source of knowledge. The Department of Mathematics has its own library consisting of nearly 5000 books. These books include a wide collection of prescribed textbooks for UG / PG level teaching and a collection of few advanced research level books/monographs. The students can also make use of the University library which has over 1, 25,000 books and periodicals. This vast collection of books is considered as boon to the students of Anna University. Many knowledge-based services like that of Reference, Bibliography, MALIBNET service, DELNET, Reprography, CD-ROM Databases, Internet browsing and e-services are provided by the library for its users. The full-fledged Digital Knowledge Center functioning in the University library is a gateway to the world of e-resources and a boon to the knowledge seeker.

## Seminar Hall

The Department of Mathematics has a well-constructed, fully equipped Seminar hall in the name of the Indian Mathematician Srinivasa Ramanujan. This completely air-conditioned hall is neatly equipped with a wall mounted LCD Display Projector and an amplified sound system. The hall is constructed in such a way that it can accommodate up to 120 members.

## Industry Institute Collaboration

1. The Department Collaborates with major software companies for its integrated Master degree programmes in Computer Science and Information Technology.

2. " Learning by Experience" (Integrated) curriculum.

3. The fundamental tools and functional knowledge are developed through a carefully co-ordinated sequence of studies in the first three years.

4. The final two years emphasize refining this journey with practical exposure.

5 The students also learn to manage, change and solve problems beyond the limitations of the traditional paradigm, enabling them to organize and manage new Ventures.

6. The Seventh semester and Tenth Semesters project work are carried out by our students in various software organizations all over the country.

## Scope for Higher Studies

After completing a five year integrated Masters programme in Computer Science / Information Technology, the opportunity for doing higher studies is quite an option. The gates of many esteemed Universities are open for these post graduates. Students can pursue a Ph.D. degree in the Indian Institute of Technologies or with good CAT scores, they can do an M.B.A. in the Indian Institutes of Management or the other option would be an M.S.Degree in universities abroad.



## Campus Placement

- Accenture Bangalore
- Amazon Bangalore
- Aricent Chennai
- CapGemini Chennai
- Cisco Systems(India) Bangalore
- Caterpillar India Chennai
- Cognizant Chennai
- Computer Associates Bangalore
- Cordys India Hyderabad
- CareVoyant Chennai
- Deloitte Consultancy Services Ltd. Hyderabad
- Force10 Networks Chennai
- eBay Chennai
- Global Scholar Chennai
- Global Analytics Chennai
- Google India Hyderabad
- HCL Technologies Ltd. Chennai
- Hewlett Packard Bangalore
- IBM India Pvt .Ltd Bangalore
- Infosys Technologies Bangalore
- Intel India Pvt.Ltd Bangalore
- iNautics Chennai
- Informatica Bangalore
- KLA Tencor Bangalore
- Microsoft India Hyderabad
- Mind Tree Consulting Pvt .Ltd Bangalore
- Morgan Stanley Advantage Services Mumbai
- Nokia Siemens Networks Chennai.
- Polaris Chennai
- Sagitec Chennai
- Source Bits Bangalore
- Symantec Bangalore
- Tata Consultancy Services Chennai
- Telecordia Chennai
- Texas Instruments Bangalore
- Thorogood Associates Bangalore
- Thought Works Bangalore
- Verizon Data Services Chennai
- Wipro Technologies Chennai
- Yahoo Software Development India Pvt Ltd. Bangalore