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Title : The future is here

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CHOOSE A SUBJECT: Computer science and engineering

The future is here

Computer science and engineering graduates have to handle everything from programming and designing apps for mobile phones to developing software for space vehicles and sci-fi films

M Balakrishnan

Every person in the developed Western world uses more than a hundred "computers or computing engines" in his day-to-day activities. An urban Indian may have already crossed 25. All these need to be loaded with applications which are designed, developed and maintained by computer science and engineering (CSE) graduates.

Computer science originated mainly from mathematics. As computing became widespread, a special branch of mathematics developed into the specialisation we call computer science today. Courses like theory of computing, discrete mathematics, graph theory etc are still considered to be on the interface of computer science and mathematics. On the other hand, computer engineering emerged out of electrical engineering — with courses such as digital design and computer architecture still on the interface of the two. With CSE emerging as a discipline and software becoming more and more complex, courses in software design and development, system software and software engineering were developed to create a comprehensive new discipline of computer science and engineering. It is still not uncommon in the United States or in European universities to have computer science programmes as part of the science faculty (sometimes even mathematics and computer science). Computer engineering programmes, too, are offered by engineering schools - even electrical and computer engineering programmes.

In India though initially BSc and MSc programmes in CS were started in some universities (and have continued), there's been growth mainly in computer science and engineering as demand for practitioners (read programmers) has increased. With pressure to increase the

intake to satisfy market demands, many institutions started BTech or BE in information technology by heavily borrowing from the CSE syllabus but to this day it remains an unfocused programme without a distinct career path.

Career options

The initial visible growth came from the programmer body-shopping outfits followed by the outsourced software development industry. As an industry catering to international markets, its pay packages have always been attractive. This meant that lots of students switched dis-

ciplines to join as programmers — a trend that started in the early '80s and is declining now with the explosive growth of CSE programmes in the country. This growth has led to increased career opportunities in academics. Well-qualified postgraduates, thus, have no dearth of jobs.

So, if you are motivated, ready to put in the hard work and have an aptitude for 'programming', you can grow fast. It is not unusual for software engineers with two to three years experience being called group leaders and with five to six years of experience becoming managers. The challenge though is the con-

stant need to update yourself due to the very fast pace of change in technology. This is true whether you are in education, industry or even in sales and maintenance.

Are you good enough?

Core computer science and engineering requires a good understanding of mathematics and basic electronics. Only a person capable of logical thinking can become a good programmer.

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SOURCE: RED CHILLIES ENTERTAINMENT

From space to special effects: Computer science can give a movie like Ra.One a special dimension and help a space mission achieve the goals set out for it

5 best choices for BE, BTech in CSE/IT

In Delhi

- Indian Institute of Technology, Delhi, www.iitd.ac.in
- Indraprastha Institute of Information Technology, Delhi, www.iiitd.ac.in
- Netaji Subhas Institute of Technology, Delhi, www.nsit.ac.in
- Delhi Technological University, www.dce.edu
- Indira Gandhi Institute of Technology (for women only), Indraprastha University, Delhi, <http://www.ipu.ac.in/igit/about.html>

Across India

- All IITs (7 old + 8 new), multiple locations across the country, <http://jee.iitd.ac.in/>
- Indian Institute of Science (M.Tech only), Bangalore, www.iisc.ernet.in
- IITs, multiple locations across the country
- National Institutes Technology, multiple locations
- Birla Institute of Technology & Science, Pilani, www.bits-pilani.ac.in

GREAT JOBS YOU CAN GET AFTER YOUR DEGREE			
Paths	Secondary area	Work titles/fields	Work description
BSc/MCA + BE/ BTech/ MSc/ MCA, MTech, Ph D	Education	Teaching	Teaching in schools. At colleges, though MTech is technically required, due to serious shortage BTechs are accepted). Teaching in a university/teaching-cum-research institutions
MTech Ph D	Research	R&D labs	Entry-level positions in both industry and government laboratories. Entry level in multi-national R&D labs but middle to senior positions in all labs
BE/ BTech/ MCA	Industry	Software development	A very large number of jobs in the industry are categorised as such. The basic profile requires application programming using languages like Java, C++ etc) and environments like (Windows *, Linux etc)
BE + database training/ skills	Industry	Database management	The jobs require management of large databases, their interface development etc
BE + network training/ skills	Industry	Network management	Here jobs are of two types: software jobs requiring network programming and management and hardware jobs require installation and maintenance of networks and related equipment
BE + VLSI training/ skills or MTech	Industry	VLSI & EDA	A related industry which draws talent from both electronics and CSE is the EDA and VLSI industry. EDA refers to electronics design automation and the jobs require development and maintenance of large number of VLSI design tools. VLSI design refers to the job of designing new VLSI or electronics devices
BE + embedded training/ skills	Industry	Embedded software & hardware	This area is linked to the enormous growth of embedded systems. Hardware and software entering simple consumer home appliances to automobiles have triggered its growth
Any graduate + training/ aptitude	Industry	Sales	PCs and laptops are seeing a tremendous growth and this has created a demand for sales engineers. Bigger companies employ CSE graduates but smaller outfits employ anyone with an aptitude for mastering the rapidly growing terminology
Any graduate + special vocational training	Industry	Maintenance	The growth in demand has generated a huge demand for those who can install and maintain these machines. Again anyone with some skill training through vocational schools/ training schools can find employment in this sector. Person with the right aptitude can grow tremendously as well