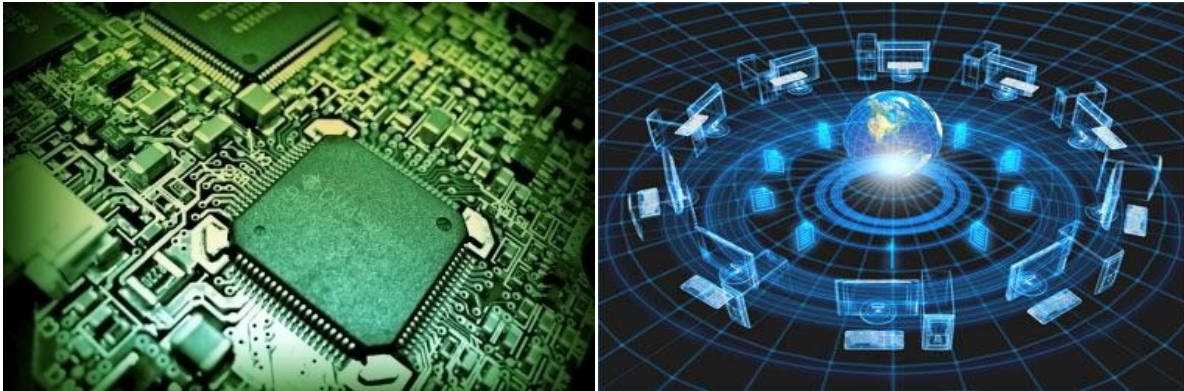


# Computer Engineering



Computer engineering is a discipline that integrates several fields of electrical engineering and computer science required to develop computer hardware and software. Computer engineers usually have training in electronic engineering (or electrical engineering), software design, and hardware-software integration instead of only software engineering or electronic engineering. Computer engineers are involved in many hardware and software aspects of computing, from the design of individual microprocessors, personal computers, and supercomputers, to circuit design. This field of engineering not only focuses on how computer systems themselves work, but also how they integrate into the larger picture.

Usual tasks involving computer engineers include writing software and firmware for embedded microcontrollers, designing VLSI chips, designing analog sensors, designing mixed signal circuit boards, and designing operating systems. Computer engineers are also suited for robotics research, which relies heavily on using digital systems to control and monitor electrical systems like motors, communications, and sensors.

In many institutions, computer engineering students are allowed to choose areas of in-depth study in their junior and senior year, because the full breadth of knowledge used in the design and application of computers is beyond the scope of an undergraduate degree. Other institutions may require engineering students to complete one year of General Engineering before declaring computer engineering as their primary focus.

There are two major specialties in computer engineering: software and hardware.

## Computer software engineering

### Software engineering

Computer software engineers develop, design, and test software. Some software engineers design, construct, and maintain computer programs for companies. Some set up networks such as "intranets" for companies. Others make or install new software or upgrade computer systems. Computer software engineers can also work in application design. This involves designing or coding new programs and applications to meet the needs of a business or individual. Computer software engineers can also work as freelancers and sell their software products/applications to an enterprise/individual



## Hardware engineering

Most computer hardware engineers research, develop, design, and test various computer equipment. This can range from circuit boards and microprocessors to routers. Some update existing computer equipment to be more efficient and work with newer software. Most computer hardware engineers work in research laboratories and high-tech manufacturing firms. Some also work for the federal government. According to BLS, 95% of computer hardware engineers work in metropolitan areas. They generally work full-time. Approximately 25% of their work requires more than 40 hours a week. The median salary for employed qualified computer hardware engineers (2012) was \$100,920 per year or \$48.52 per hour. Computer hardware engineers held 83,300 jobs in 2012.



## Specialty areas in Computer Engineering

### Coding, cryptography, and information protection

Computer engineers work in Coding, Cryptography, and Information Protection to develop new methods for protecting various information, such as digital images and music, fragmentation, copyright infringement and other forms of tampering. Examples include work on wireless communications, multi-antenna systems, optical transmission, and digital watermarking.



### Communications and wireless networks

Those focusing on communications and wireless networks work advancements in telecommunications systems and networks (especially wireless networks), modulation and error-control coding, and information theory. High-speed network design, interference suppression and modulation, design and analysis of fault-tolerant system, and storage and transmission schemes are all a part of this specialty.



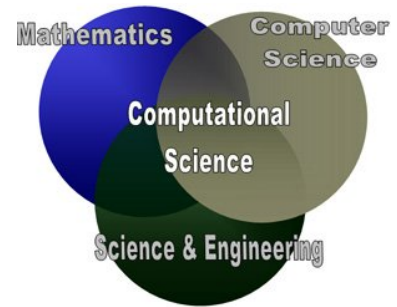
### Compilers and operating systems

This specialty focuses on compilers and operating systems design and development. Engineers in this field develop new operating system architecture, program analysis techniques, and new techniques to assure quality. Examples of work in this field includes post-link-time code transformation algorithm development and new operating system development.



## Computational science and engineering

Computational Science and Engineering is a relatively new discipline. According to the Sloan Career Cornerstone Center, individuals working in this area, "computational methods are applied to formulate and solve complex mathematical problems in engineering and the physical and the social sciences. Examples include aircraft design, the plasma processing of nanometer features on semiconductor wafers, VLSI circuit design, radar detection systems, ion transport through biological channels, and much more".



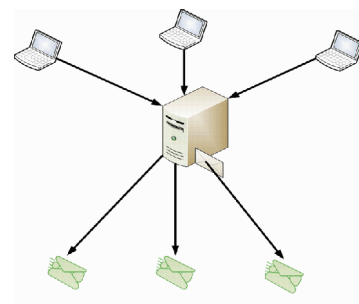
## Computer networks, mobile computing, and distributed systems

In this specialty, engineers build integrated environments for computing, communications, and information access. Examples include shared-channel wireless networks, adaptive resource management in various systems, and improving the quality of service in mobile and ATM environments. Some other examples include work on wireless network systems and fast Ethernet cluster wired systems.



## Computer systems: architecture, parallel processing, and dependability

Engineers working in computer systems work on research projects that allow for reliable, secure, and high-performance computer systems. Projects such as designing processors for multi-threading and parallel processing are included in this field. Other examples of work in this field include development of new theories, algorithms, and other tools that add performance to computer systems.



## Computer vision and robotics

In this specialty, computer engineers focus on developing visual sensing technology to sense an environment, representation of an environment, and manipulation of the environment. The gathered three-dimensional information is then implemented to perform a variety of tasks. These include, improved human modeling, image communication, and human-computer interfaces, as well as devices such as special-purpose cameras with versatile vision sensors.



## Embedded systems

Individuals working in this area design technology for enhancing the speed, reliability, and performance of systems. Embedded systems are found in many devices from a small FM radio to the space shuttle. According to the Sloan Cornerstone Career Center, on going developments in embedded systems include "automated vehicles and equipment to conduct search and rescue, automated transportation systems, and human-robot coordination to repair equipment in space.



## Integrated circuits, VLSI design, testing and CAD

This specialty of computer engineering requires adequate knowledge of electronics and electrical systems. Engineers working in this area work on enhancing the speed, reliability, and energy efficiency of next-generation very-large-scale integrated (VLSI) circuits and microsystems. An example of this specialty is work done on reducing the power consumption of VLSI algorithms and architecture.



## Signal, image and speech processing

Computer engineers in this area develop improvements in human-computer interaction, including speech recognition and synthesis, medical and scientific imaging, or communications systems. Other work in this area includes computer vision development such as recognition of human facial features.



## **Career Opportunities for Computer Engineering**

Recent surveys show that computer engineering graduates are amongst the most highly sought after and most well-paid university graduates. From national security to gaming, computer engineers are at work.

Students in the Computer Engineering program have the opportunity to participate in a 12-month or 16-month professional internship and earn an income, make professional contacts, and apply their knowledge at the same time.

Graduates of the Computer Engineering program who choose not to move directly into careers in industry, may branch into technical business management by pursuing an MBA degree, or continue on to Master's or Ph.D. degrees for careers in research.

Following big companies IT company provide opportunities to work as Computer engineer.

Amazon	\$103,000
Apple	\$116,000
Bloomberg L.P.	\$102,000
Brocade Communications	\$114,000
Cisco Systems	\$112,000
Citrix Systems	\$90,000
eBay	\$110,000
Expedia	\$98,000
Facebook	\$133,000
Google	\$138,000
Hewlett-Packard	\$93,000
IBM	\$88,000
Intel Corporation	\$103,000
Intuit	\$93,000
Juniper Networks	\$129,000
LinkedIn	\$115,000
Microsoft	\$100,000
NVIDIA	\$110,000
Oracle	\$108,000
PayPal	\$108,000
Qualcomm	\$88,000
Texas Instruments	\$93,000
Twitter	\$117,000
VMware	\$105,000
Yahoo	\$107,000
Zynga	\$120,000



## Engineers

USA Cities	Average Salary
Atlanta, GA	\$86,000
Boston, MA	\$103,000
Chicago, IL	\$96,000
Dallas, TX	\$95,000
Denver, CO Area	\$94,000
Los Angeles, CA	\$94,000
Minneapolis, MN	\$80,000
New York City, NY	\$114,000
Philadelphia, PA	\$94,000
Phoenix, AZ	\$84,000
Portland, OR	\$84,000
San Diego, CA	\$95,000
San Francisco, CA	\$116,000
Seattle, WA	\$104,000
Washington, DC	\$103,000

## Top Highest Paying Jobs in Computer Software Engineering

Computer Software Engineer Jobs	Average Salary
<b>Software Engineer Average Salary</b>	<b>\$95,000</b>
Software QA Engineer	\$88,000
Applications Software Engineer	\$88,000
Systems Software Engineer	\$90,000
PHP Software Engineer	\$92,000
Python Software Engineer	\$93,000
C++ Software Engineer	\$93,000
Firmware Engineer	\$94,000
Perl Software Engineer	\$94,000
Java Software Engineer	\$96,000
Mobile Application Developer	\$96,000
Objective-C Software Engineer	\$96,000
Ruby on Rails Software Engineer	\$97,000
Android Software Engineer	\$98,000
Lead Software Engineer	\$98,000
Principal Software Engineer	\$99,000
iOS Software Engineer	\$108,000
Web UI Software Engineer	\$110,000

**TOTAL INTAKE OF COMPUTER ENGINEERING IN GUJARAT**

<b>Sr. No.</b>	<b>GOVERNMENT/GIA DEGREE ENGINEERING COLLEGES</b>	<b>Intake</b>
1	Faculty of Technology & Engg., Vadodara(Gia) **	60
2	Faculty of Technology, Dharmsinh Desai University, Nadiad(Gia) **	45
3	Government Engineering College, Bhavnagar	60
4	Government Engineering College, Dahod	60
5	Government Engineering College, Modasa	120
6	Government Engineering College, Patan	120
7	Government Engineering College, Rajkot	120
8	Government Engineering College, Sec-28,Gandhinagar	120
9	L. D. College of Engineering, Ahmedabad	120
10	Vishwakarma Government Engg. College, Chandkheda, Ahmedabad	120
	<b>PPP MODE DEGREE ENGINEERING COLLEGES</b>	
11	Gujarat Power Engg. & Res. Institute (GPRI), Mevad, Dist: Mehsana	60
12	<b>GIDC Degree Engineering College, Abrama, Navsari</b>	60
	<b>SELF FINANCED DEGREE ENGINEERING COLLEGES</b>	
13	A. D. Patel Institute of Technology, Karamsad	60
14	Ahmedabad Institute of Tech, Ognaj Road, Ahmedabad	120
15	Alpha College of Engg. & Tech., Khatraj, Kalol	60
16	Amiraj College of Engineering & Technology, Sanand, Ahmedabad	60
17	Arrdekta Institute of Technology, Radhiwad, Dist : Sabarkantha	60
18	Arun Munchhala Engineering College, Amreli	60
19	Atmiya Institute of Technology & Science, Rajkot	120
20	B. H. Gardi College of Engineering & Technology, Anandpar Dist.: Rajkot	120
21	Babaria Institute of Technology,Varnama,Vadodara	180
22	Balaji Engineering College, Jud-Dhoraji Highway, Makhiyala	60
23	Bhagwan Mahavir College of Engg. & Tech., New R.S. No. 149 of Village Vesu, Tal. Choryasi, Dist. Surat	60
24	Birla Vishvakrma Mahavidyalya, Vallabhvidyanagar	60
25	C. K. Pithawala College of Engineering & Technology, Surat	60
26	C. U. Shah College of Engineering.& Technology.,Wadhvan	90
27	Chandubhai S Patel Inst. of Tech., Changa, Dist. Anand **	120
28	Chhotubhai Gopalbhai Patel Institute of Tech., Tarsadi, Bardoli **	60
29	D. A. Degree Engineering and Technology, Nr. Khatraj Chokdi, Mahemdabad, Kheda	60
30	Darshan Institute of Engg. & Tech., Rajkot-Morbi Highway, Hadala	120
31	Dr. Jivraj Mehta Institute of Technology, NH 8, MOGAR, Anand-388340	60
32	Dr. Subhahsh Technical Campus, Khamdhrol Road, Junagadh-362 001	60
33	Enggininger College, Tuwa, Godhara	60
34	Faculty of Engg., Tech. & Research (FETR), Isroli (AFWA), Bardoli, Surat	60
35	Faculty of Technology, Dharmsinh Desai University, Nadiad **	75
36	G. H. Patel College of Engineering & Technology, V. V. Nagar	60

37	G. K. Bharad Institute of Engg., Kastruba Dham, Rajkot	60
38	Gandhinagar Institute of Technology, Gandhinagar	120
39	Grow More Faculty of Engg., Berna, Himmatnagar	60
40	Hansaba College of Engg. & Tech., Sidhpur-Patan	60
41	Hasmukh Goswami College of Engg, A/P: Vahelal, Ta:Daskroi Dist: Ahmedabad	90
42	HJD Institute of Technical Education and Research, Gajjod Road, Kera, Kutch-370430	60
43	Indus Institute of Technology & Engg, Rancharda, Ahmedabad **	60
44	Institute of Technology, Nirma University, Ahmedabad **	120
45	Institute of Tech. & Manag. Universe Technical Campus, Paladi, Waghodiya	120
46	Ipcowala Institute of Engg. & Tech., Dharmaj, Dist.: Anand	60
47	K. J. Institute of Engg. And Tech., Savali, Dist. Vadodara	60
48	Kalol Institute of Technology & Research Centre, Kalol	60
49	Kankeshwaridevi Inst. of Tech., Village Naranpara, Dist. Jamnagar	60
50	L. C. Institute of Tech. Bhandu, Mehsana	60
51	L. D. R. P. Institute of Tech. & Research, Gandhinagar **	180
52	L. J. Institute of Engineering & Technology, Nr Sarkhej Anand Cross Road, Ahmedabad	120
53	Laxmi Institute of Technology, Sarigam, Laxmi Vidyapeeth, Sarigam P. O. Valsad - 396155	60
54	Leads Institute of Tech. & Engg., Matar, Dist: Bharuch	60
55	M & B Patel Women Institute of Engg. for Studies & Res. in Computer & Comm. Tech., New V V Nagar (For Girls)	240
56	Mahatma Gandhi Inst. of Tech. Edu. & Research Centre, Navsari	120
57	Mahavir Swami College Of Engineering & Technology, Bharthana-Vesu, Surat	60
58	Marwadi Edu. Foundation Group of Institutions, Faculty of Engg., Rajkot	120
59	Marwadi Edu. Foundation Group of Institutions, Faculty of Tech., Rajkot	60
60	Merchant Engg. College, Basna, Visnagar	60
61	Narayan Shashtri Institute of Tech., Swaminarayan Gurukul, Jetalpur, Tal. Daskroi, Dist. Ahmedabad	60
62	Nobel Engg. College, Parth Vatika, Junagadh Bhesan Road, At. Bamangam	60
63	OM Engineering College, Chokli, Dist: Junagadh	60
64	OM Institute of Technology, Vantavachhoda, Po: Shahera Dist: Panchmahal	60
65	Pacific School of Engg., Surat	60
66	Parul Institute of Engg. And Technology, Limda, Vaghodia	240
67	Parul Institute of Technology, Limda, Vaghodia	60
68	Rai University, Saroda, Dholka Taluka, Ahmedabad	60
69	S.P.B. Patel Engg College, Ahmedabad-Mahesana Hway., Linch, Mahesana	60
70	Sabar Institute of Tech. for Girls, Tajpur, Sabarkantha (For Girls)	120
71	Sankalchand Patel College of Engineering, Visnagar	90
72	SAL College of Engineering, Ahmedabad	60
73	SAL Institute of Tech. & Engg. Research, Ahmedabad	120
74	Samarth College of Engg. & Technology, Samarth Campus, Opp. Sabar Dairy,	60



	NH-8, Hajipur, Himatnagar, Sabarkantha-383001	
75	Sanjaybhai Rajguru College Of Engineering (OM Shanti Engg College), At. Hadmatiya (Bedi), Tal. Rajkot	60
76	Saraswati Institute of Engineering & Mana., Rajpur, KADI	60
77	Sardar Patel Institute of Tech., Piludara, Mehsana	60
78	Sardar Vallabhbhai Patel Institute of Technology, Vasad	120
79	Sarvjanik College of Engineering & Technology, Surat	120
80	School of Engineering - R.K. University, Rajkot **	120
81	SHANKARSINGH VAGHELA BAPU INSTITUTE OF Tech., Unava, Gandhinagar	60
82	Shri J. M. Sabva Institute of Engg & Tech, Botad	60
83	Shri Labhubhai Trivedi Institute of Engg And Tech., At Village Mavdi, Near G E C, Kalawad Road, Rajkot-360005	60
84	Shri. Pandit Nathulalaji Vyas Technical Campus, Wadhawan	60
85	Shri S'ad Vidhya Mandal Institute of Technology, Bharuch	60
86	Shri Satsangi Saketdham 'Ram Ashram' Group of Institutions, At. & Po. Vadasma, Mehsana-382708	60
87	Shri Sitaram N Patel Inst. of Tech. & Res. (Vidhyabharti Trust Inst of Tech. & Res. Centre), Umrakh, Bardoli	60
88	Shri Swami Atmanand Saraswati Institute of Tech., Surat	30
89	Sigma Institute of Engineering, Bakrol, Vadodara	60
90	Silver Oak College of Engg. & Tech., Ahmedabad	180
91	Smt. S.R. Patel Engg. College, Dabhi, Unjha	60
92	Swaminarayan College of Engg. & Tech., Kalol	60
93	Takshshila College of Engg. & Tech., Village Ishwariya, Rajkot	120
94	U.V.Patel College of Engineering ,Mehsana **	60
95	Universal College of Engineering & Technology, Moti Bhoyan	90
96	V.V.P. Engineering College, Rajkot	60
97	Vadodara Institute of Engg., Kotambi , Waghodia	120
98	Valia Institute of Technology, Valia, Bharuch	30
99	Veerayatan Group of Institutions, Faculty of Engg., Jakhania, Ta.Mandvi, Kutch- 370460	60
100	Venus International College of Tech., Bhoyan Rathod, Gandhinagar	60
101	Vidhyadeep Institute of Management & Techonlogy, Anita, Dist : Surat	60
	<b>Total</b>	<b>8280</b>