
WHAT CAN I DO WITH A MAJOR IN ... **COMPUTER ENGINEERING**

OCCUPATIONAL SUMMARY

Computer engineering is typically thought of as the combination of computer science and electrical engineering. The [Institute of Electrical and Electronics Engineers \(IEEE\) \(2004, December 12\)](#) explains that computer engineering “embodies the science and technology of design, construction, implementation, and maintenance of **software and hardware** components of modern computing systems and computer-controlled equipment.” IEEE explains that computer engineers design systems for highly specialized applications found in a variety of industries such as aerospace, automotive, telecommunications, power production, medicine, manufacturing, defense, and products such as electronics and major appliances.

Computer hardware engineering is a potential career path for computer engineers. The [Bureau of Labor Statistics \(BLS\) \(2012\)](#) explains that computer hardware engineers, “research, design, develop, and test computer equipment such as chips, circuit boards, or routers.” BLS also highlights that computer hardware engineers ensure that computer hardware components are compatible with emerging software updates.

EMPLOYMENT REQUIREMENTS

IEEE explains that computer engineers must have a strong foundation in computer science and electrical engineering concepts. Furthermore, IEEE highlights that computer engineers must be life-long learners in order to keep their knowledge and skills up-to-date with the rapidly changing computing field.

Specific to computer hardware engineering, BLS explains that a bachelor's degree in computer engineering is the minimum formal education required to enter the profession. However, BLS also highlights that some large firms or specialized jobs require a master's degree in computer engineering. Many employers in engineering fields value practical experience, making it important for computer engineering students to participate in internships and Co-ops while completing their degree. A graduate degree (M.S., M.E., and/or Ph.D.) is required to hold positions in management, research, or academia. Consult [O*Net](#) for more information on the specific KSAs (Knowledge, Skill, Ability) that are required for this career.

THE UNIVERSITY OF NEW MEXICO

The UNM [Electrical and Computer Engineering \(ECE\)](#) department offers a Bachelor of Science in Computer Engineering (B.S.Cp.E.), Master of Science in Computer Engineering (M.S.), and a Doctor of Philosophy in Engineering with a concentration in Computer Engineering (Ph.D.). The UNM Undergraduate Computer Engineering program offers three tracks: software, hardware, and digital media. Check the [department website](#) for more information on degree programs and research areas. The College of Engineering also offers various other degree tracks such as the Master of Engineering and the 2 + 3 B.S. & Master of Business Administration program. More information on these programs can be found in the [University Catalog](#) by selecting “Colleges” on the right and selecting “School of Engineering”.

INDUSTRIES & TARGET EMPLOYERS

A variety of employers specifically recruit UNM students and alumni. Consult UNM's [Lobo Career Connection](#) for a complete list of employers and current job postings. Speak with a Career Development Facilitator at the [UNM Office of Career Services](#) for help with identifying employers or additional resources for your occupation of choice.

Business/Industry

Consulting, development, project management, electronics, fuels and energy, manufacturing, sales, aerospace, automotive, telecommunications, power production, medicine, electronics, major appliances, bioengineering, robotics, coding, cryptography, information protection, wireless networks, computer operating systems, automated vehicles, signal/image/speech processing

Government

Federal, national and local government agencies, Department of Energy, Department of Defense, research, [national laboratories](#)

Education

University/college instruction or administration, researcher

SUGGESTED STRATEGIES

- Gain related computer engineering or general engineering professional experience through involvement in [internships](#), student employment, [Co-ops](#), research, and/or volunteer opportunities.
- Shadow professionals in the field to gain a better understanding of the occupation and to build relationships with professional mentors.
- Build your network and get involved on campus through student organizations and campus events. The [School of Engineering website](#) outlines student organizations that are affiliated with the School of Engineering as well as the Computer Engineering department. You can find more organizations and events at the [Student Activities Center website](#).
- Attend [career-related campus events](#) such as career fairs, company information sessions, and or career workshops.
- Students who are interested in graduate school should maintain a high undergraduate GPA, develop relationships with faculty, and participate in undergraduate research. UNM's Research Opportunity Database at <http://research-match.unm.edu/>. Some research opportunities include
 - [Ronald E. McNair Scholars Program](#)
 - [Research Opportunity Program \(ROP\)](#)
 - [Minority Access to Research Careers Program \(MARC\)](#)
 - [Initiative for Maximizing Student Development \(IMSD\)](#)
 - [Undergraduate Pipeline Network](#)
 - [UNM Engineering Research Centers](#)
 - [Research at the University of New Mexico](#)
- Speak with [mentors](#) and faculty about career opportunities.
- Job leads can be found on your department's website, list-serv, newsletters, and social media sites.
- Familiarize yourself with the [federal job](#) application process.

STATE & NATIONAL WAGES

[Adapted from CareerOneStop \(2013\)](#)

COMPUTER HARDWARE ENGINEER

Location	2012				
	10%	25%	Median	75%	90%
United States	\$64,000	\$79,600	\$100,900	\$125,700	\$150,100
New Mexico	\$74,500	\$83,500	\$95,300	\$113,500	\$134,800

INFORMATIONAL WEBSITES

Association for Computing Machinery	http://www.acm.org/
Institute of Electrical and Electronics Engineers Computer Society	http://www.ieee.org/
IEEE Computer Society	http://www.computer.org/
International Association of Computer Science and Information Technology	http://www.iacsit.org/
IACSIT Software Engineering Society	http://www.iacsit.org/society/ses.htm

REFERENCES

- Bureau of Labor Statistics, U.S. Department of Labor, (2012, April 10). *Occupational Outlook Handbook, Computer Hardware Engineers*. Retrieved from <http://www.bls.gov/ooh/architecture-and-engineering/computer-hardware-engineers.htm#tab-4>
- IEEE Computer Society, Joint Task Force on Computing Curricula (2004, December 12). *Curriculum Guidelines for Undergraduate Degree Programs in Computer Engineering*. Retrieved from http://www.acm.org/education/education/curric_vols/CE-Final-Report.pdf
- State of Minnesota, U. S. Department of Labor, Employment and Training Administration (2013). *CareerOneStop, Occupation Profile, Chemical Engineer*. Retrieved from www.careerinfonet.org
- University of New Mexico, Electrical and Computer Engineering Department (2013, March). *ECE Undergraduate Handbook*. Retrieved from http://www.ece.unm.edu/undergrad/29th-Draft-UgradHndbk_12March2013.pdf