Academic Software Engineering: What Is and What Could Be?

Results of the First Annual Survey for

International SE Programs

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ABSTRACT

According to data received from an international survey, almost 6800 students are enrolled in software engineering degree programs in 11 countries, as of January, 2001. A total of 94 academic programs in software engineering are in place at 60 universities with 350 full-time faculty and nearly 200 part-time faculty teaching hundreds of undergraduate and graduate courses in the discipline. Over 5500 people have obtained degrees in software engineering since 1979. The authors are conducting the first of an ongoing annual survey of international academic software engineering programs, as a joint ACM/IEEE-CS project. This status report covers: history, audience, initial survey, initial partial results available on the WWW, request for evaluation of WWW-site, request for additional questions for next version of survey, time-line for next version of the survey, "lessons learned," and some future directions. The annual report and survey results will be posted on a wide variety of web pages. A more current report, based on the sabbatical of the first author, will be presented at the conference. The sabbatical involves the initial development of an "International Software Engineering University Consortium – ISEUC." A sample scenario for an employee in industry who becomes a student in ISEUC is given.

Keywords
Education, survey, international

1 INTRODUCTION

"You have to know where you are before you know where you are going."

"We will certainly run out of educated labour – the only hope is to develop the rest of the world… The big challenge is education, but the educational institutions are amongst the most conservative institutions in the world!"
Dr. Manuel Castells
Professor of Sociology
University of California at Berkeley
Opening plenary session at 22nd International Conference on Software Engineering
Limerick, Ireland
June 7-9, 2000

The funded survey is intended to continue an effort originating at the Software Engineering Institute but discontinued in the mid-1990's. The list of software engineering programs had been maintained on an ad-hoc, volunteer basis until ACM and IEEE-CS funded this project in August, 1999. We address the issue of acquiring the information for a large and accurate database of such Software Engineering (SE) programs, from which the funding sponsors or others could derive statistically meaningful results. It represents a simple and inexpensive procedure that has immediate utility. The initial survey built upon existing databases compiled by SEI in 1996, Peter Knoke for FASE in 1998 [3] and Laurie Werth in 1999. The authors have graciously provided such data via e-mail and WWW sites.

2 AUDIENCE
The project provides a continuing and reliable source of data regarding the colleges and universities (private, public, military, consortia, international) offering degrees, programs, and certificates in the software engineering field.

Only those institutions offering degrees and identifiable tracks/options in SE are included initially. Institutions offering a course or two in SE are not considered. This list is comprised of, but not limited to:

- Associate Degree (two-year) programs from community colleges
- Bachelor Degree (four/five-year) programs from colleges and universities
- Master Degree programs from colleges and universities
- Doctoral Degree programs from colleges and universities
- Certificate programs from colleges and universities
- [LATER, during year 2 of the project] Degrees in a software-related discipline, e.g, "Software Design and Development" as indicated in a FASE survey [3].
- [LATER, during year 2 of the project] Programs from other providers, e.g., Motorola and Rational Universities. A pointer in the survey to the existing such database compiled by the University of Texas would be a possibility.

3 SURVEY QUESTIONS

These were designed by the proposal team and include those in previous surveys such as:

- Program information such as level, title, year of inception
- Students enrolled: full-time and part-time
- Graduates
- Faculty: full-time and adjunct
- Unit containing the program (location within college/university)
- Number of courses (undergrad/grad) and length of term (semester/quarter)
- Point of contact information: name, address, URL, e-mail, phone, etc.

"Extra credit" questions related to software engineering definitions (some from the literature plus an open-ended option) as well as referrals to other universities with SE programs are also included in the survey. A copy of the survey appears as appendix A. Please feel free to respond, in the event you have not already done so.

4 INTIAL RESULTS

Current numbers are as follows, out of the 85 people who have responded:

Universities w/ SE programs	60
Universities w/o SE programs	25
Countries w/ software engineering programs	11

Number of SE programs at all levels	94
Total students enrolled in SE programs	6799
Full-time	3912
Part-time	2119
Number of graduates from SE programs	5481
Number of programs on the semester system	65
Number of programs on the quarter system	11
Number of full-time faculty in Software Engineering	350
Number of part-time faculty in Software Engineering	192

Rank ordering of definitions for SE (by voting)

[See survey at end, for exact wording of definitions]

IEEE Standards Collection: SE	29
Texas Board of Professional Engineers	23
NATO	21
Personal definitions, as requested	17
Parnas	14
Computing Research Association	9

Referrals

Number of universities referred	170
Number of universities giving referrals	24

It is clear that validation must be done on these numbers, before they can become anything like "official" statistics.

The results are available from the authors in the following formats, and can be e-mailed as attachments, upon request:

File Information Results	Format
1. Survey data [Appendix B]	Excel
2. Point-of-contact for universities responding with SE programs	Word
3. Point-of-contact for universities responding w/o SE programs	Word
4. Definitions of SE	Excel
5. Own definitions of SE	Word
6. Referrals to other potential universities with SE programs	Word

The data for the above, as of the time of presentation, will be handed out at the conference. Data that is current is enclosed as an attachment. Up-to-date information will always be available at the WWW-site. Items 1 and 2 were contained in a prototype WWW-site developed by a student team in a software engineering course at the University of Michigan-Dearborn campus during January-April, 2000.

The prototype URL is http://www.cis.umd.umich.edu:8085 Current respondents may edit their existing program information, and the general public may view current data from items 1 and 2 above, as well as some preliminary graphical summaries. We are keenly aware of several "shortcomings" in this prototype, so your constructive recommendations will be most helpful. Earlier versions of this have been made available to all survey respondents. We are deeply indebted to Dr. Renee McCauley at USL, and her students, as she graciously allowed us to use what she had developed for the CSAC Annual Surveys.

5   REQUEST FOR EVALUATION OF INITIAL RESULTS

The next version of the survey results will be enhanced considerably with the inputs from knowledgeable individuals reading this status report. We already have a team in place to take your recommendations. These recommendations can be of any type: navigation, user interface, typos, grammar, portability, functionality, performance, etc. A major concern is trying to ascertain some common metric for "credit-hours" among differing academic systems. We are quite interested in additional features that you would find useful. Some we are considering include graphical display of all the university sites that offer SE programs, with hyperlinks to the programs.

6   ADDITIONAL SURVEY QUESTIONS

Ones we have considered so far include the following:
- Content of SE curricula for various levels
- Available via distance learning
- Available in an on-campus setting
- Formal interaction with local industry
- Assistantships available
- Level of interest in collaboration with other SE programs
- Role of formal methods "vs." traditional methods

What additional ones would you find meaningful?

7   TIMELINE FOR NEXT VERSION OF SURVEY

We plan to have the next version of the survey and results on-line by April 1, 2001. Such data and the summaries will be published in world-wide accessible forums such as web pages for the Forum for Advancing Software engineering Education (FASE), as well as *ACM Software Engineering Notes*, *IEEE Transactions on Software Engineering,* ICSE conferences, a SEI report and other IEEE-CS and ACM outlets as desired by the sponsors. It could consequently be used by decision makers at all levels. It would also draw potential students, as well as schools considering adding SE programs, IT employers, employees, and others.

8   LESSONS LEARNED

The following are some of the "lessons learned" from this project:

1. Always be cognizant of the viability of your funding source, i.e., the withdrawal of ACM from SWECC on June 30, 2000, over concerns about SE licensing.

2. Always build in buffers in your project plan, even when a risk assessment is done, as unanticipated events can and will "always" occur.

3. In the future, ask for contact information that includes e-mail addresses. It takes far too long to look up the appropriate person, just given the name of a university. For example, one person provided a list of 54 universities in the UK that offer undergraduate BA/BSc SE courses, but no URLs or e-mails were supplied.

4. Continue to build on the shoulders of others, both for content of the survey, as well as the underlying code (ASP from USL) – tremendous time-saver with no loss of quality.

5. Continue spiral methodology of prototyping first, with textual output, and then adding graphical, from user interface viewpoint.

6. Continue "versioning" of the survey instrument, as new and meaningful questions continue to surface, even though this causes problems with base lining.

7. Do not underestimate the difficulty of common metrics for credit hours – do not be so USA-centric!

8. Do not throw ANYTHING away! We have lost the e-mail addresses for some of the contact people from earlier surveys and it is a major pain to recover these.

9. This is very much a team effort, as there is far too much for one individual to do at the onset, although maintenance is not too bad, once the complete survey and display of results are fully on the WWW-site.

9   FUTURE DIRECTIONS

The first author plans to use the results of this initial survey as a key component in his sabbatical for 2000-2001. Such data is essential to address the following plan for developing an International Software Engineering University Consortium:

Problem: Lack of trained software engineers to address the dramatic worldwide growth in Information Technology (IT)

Solution: Increase the number of such trained and educated people throughout the world and their effectiveness and efficiency by creation of an International Software Engineering University Consortium (ISEUC). Provide just-in-time state-of-the-art software engineering

knowledge and skills at all levels (degrees, certificates, courses, modules) to current and future employees drawing on potential sources of acknowledged academic software engineering expertise, as given below.

Goal: Provide major leverage to early adopters of this first innovative collaboration involving acknowledged sources of software "people" pool and the software industry; thus reducing artificial schism between industry and academia in software engineering.

How: Build a worldwide integrated resource of academic software engineering expertise, available via both local in-person and distance learning modes. Use virtual teams. Industry has current and future development sites located throughout the world. When performing software development, the developers are often a virtual team, and with ISEUC, there would be virtual student teams as well. Model after National Technological University, but focus on Software Engineering, and not restrict to U.S. institutions, nor to satellite/video-tape delivery. See Appendix C for a sample scenario.

10 SUMMARY

According to data received from an international survey, nearly 6800 students are enrolled in software engineering degree programs in 11 countries, as of January, 2001. A total of 94 academic programs in software engineering are in place at 60 universities with 350 full-time faculty and nearly 200 part-time. This is essential baseline data as the software engineering discipline peers into the future, "in search of a software engineering profession." The authors are conducting the first of an ongoing annual survey of international academic software engineering programs, as a joint ACM and IEEE-CS project. This status report covered: history, audience, initial survey, initial partial results available on the WWW, request for evaluation of WWW-site, request for additional questions for next version of survey, time-line for next version of the survey, lessons learned and some future directions. The most current data, based on the sabbatical of the first author, will be presented at the conference. The sabbatical involves the initial development of an "International Software Engineering University Consortium– ISEUC." A sample scenario for an employee in industry who becomes a student in ISEUC was given.

APPENDIX A

Survey on Software Engineering Academic Programs

1. Date: _____

2. Name of institution: _____

3. Is there an academic program at your institution that has at least one degree, concentration or track in software engineering? (Use an X for your answer.)

____ Yes ____ No

If your answer is "No", please skip to question 16. Otherwise please continue with question 4.

4. Academic unit(s) that house software engineering (e.g. College of Engineering)

   a. _____

   b. _____

5. The academic department(s) that house software engineering

   (e.g. Department of Computer Science)

   a. _____

   b. _____

6. Actual title of degree(s) offered that is (are) related to software engineering, as it would appear on the graduate's diploma, and the field of study for the program, e.g.

Bachelor of Science (B.S.)

   Software Engineering

   Computer Science (concentration in SE identifiable)

   Computer Engineering (concentration in SE identifiable)

   Information Systems (concentration in SE identifiable)

   Software Engineering Technology

   Other?

Master of Science (M.S.)

   Ditto

Doctor of Philosophy (Ph.D.)

   Ditto

   a. Title _____ Field _____

   b. Title _____ Field _____

   c. Title _____ Field _____

   (Please add more lines if necessary)

For questions 7-10 below, fill in slots a, b, and c with information corresponding to that degree.

7. Approximate date the degree(s) began

   a. ____ b. ____ c. ____

8. Number of credit hours required for each degree: use a range of hours if appropriate

   a. ____ b. ____ c. ____

9. Approximate number of students in each degree

program:

    a. ____ Total ____ Full-time ___ Part-time

    b. ____ Total ____ Full-time ___ Part-time

    c. ____ Total ____ Full-time ___ Part-time

10. Approximate number of graduates in each degree program to date

    a. ____   b. ____   c. ____

11. Total number of software engineering courses available:

        Undergraduate ____

        Graduate   ____

12. System used for courses at your institution (mark an X by which answer is the most appropriate):

    ____ semester system (course length is 15-16 weeks)

    ____ quarter system (course length is 10-11 weeks)

    ____ other (describe) _____

13. Number of full-time faculty with primary interest in software engineering: ____

14. Number of part-time faculty with primary interest in software engineering: ____

15. Web URL address of information about the degree programs:

    _____

16. Name, e-mail, phone and postal address of contact person:

_____

Other universities/colleges that may have software engineering programs:

_____

The following are some definitions of software engineering. Please circle the ones with which you agree. If none, what is your definition or one you believe to be more accurate?

1.   Texas Board of Professional Engineers [6]

"The practice of software engineering will mean a service or creative work such as analysis, design, or implementation of software systems, the adequate performance of which requires appropriate education, training or experience. Such education, training, or experience shall include an acceptable combination of: computer sciences such as computer organization, algorithm analysis and design, data structures, concepts of programming languages, operating systems, and computer architecture.; software design and architecture; discrete mathematics; embedded and real-time systems; or other engineering education. Such creative work will demonstrate the application of mathematical, engineering, physical or computer sciences to activities such as real-time and embedded systems, information or financial systems, user interfaces, and networks "

2.   Computing Research Association [1]

"[Software Engineering] Graduates work with the engineering of software, with special attention devoted to large and critical systems."

3.   IEEE [2]

"Software Engineering: (1) The application of a systematic, disciplined, quantifiable approach to the development, operation, and maintenance of software; that is, the application of engineering to software. (2) The study of approaches as in (1)."

4.   NATO [4]

'Software engineering is the establishment and use of sound engineering principles in order to obtain economically software that is reliable and works efficiently on real machines." (Fritz Bauer)

5.   Parnas [5]

"The members of the Software Engineering profession should know that subset of Computer Science that is relevant to software design, but they must also share the knowledge about design, mathematics, and other sciences that are traditionally known by Engineers."

6.   Yours???

APPENDIX B.1

Results to Date

Universities, by Country/Continent

APPENDIX B.2 Programs -- attached

<u>USA</u>

Auburn, Butler, California State University system, Cal Poly, Carnegie Mellon, Carroll, Colorado Technical University, East Tennessee State, Embry-Riddle, Florida A&M, Florida State, Gannon, George Mason, Kansas State, Mercer, Milwaukee School of Engineering, Mississippi State, Monmouth, Naval Postgraduate School, Oregon Consortium, Rochester Institute of Technology, Santa Clara, Seattle, Southern Methodist, Southern Polytechnic, Stevens Institute of Technology, Texas State Technical College, Texas Tech, University of Michigan-Dearborn, University of Missouri-KC, University of Nebraska,

Scranton, University of St. Thomas, University of Washington-Bothell, University of Wisconsin-Platteville

Canada: Calgary, Ottawa, McMasters, Concordia

United Kingdom: Wales, Strathclyde

Ireland: Galway

European Continent: Stuttgart, Slovakia, Sweden, Spain

South Pacific: Australia, New Zealand

South America: Ecuador

APPENDIX C

Sample Scenario for International Software Engineering University Consortium (ISEUC)

Anna Sigfried, an employee of Ford in Aachen, Germany, is an engineer who is anxious to rise up through the ranks to become a senior technical staff member. She already has an undergraduate (Universität) degree from Stuttgart in Computer Science, and would like to continue her studies in Software Engineering – it is clear that automotive systems increasingly rely on software and it must be reliable and robust, and yet very efficient. Her manager, Elsa Mandell, is very supportive of Anna and tells her to do some searching for courses and/or degrees that could be useful to Anna in her aspirations and be of utility to Ford.

So Anna turns to the Internet and searches for "Software Engineering Programs." Many appear, but one stands out – the International Software Engineering University Consortium" or just "ISEUC." She notes that ISEUC offers courses that are perfect for her – there are several that are available via the Internet, using distance learning, as well as some that are relatively close by from her alma mater, the University of Stuttgart. Upon further investigation, she discovers that the distance learning courses are high-quality ones from all around the world. She selects the following to take during the coming year:

High Integrity Systems

University of Strathclyde	Dr. Robin Hunter

Software User Interface

University of Michigan-Dearborn	Dr. Bruce Maxim

Software Architecture

University of Queensland	Dr. David Carrington

Software Processes & Product Metrics

Rochester Institute of Technology	Dr. Mike Lutz

Software Management and Maintenance

Universität Stuttgart	Dr. Jochen Ludewig

The last course is available relatively "close by," so she knows she will have personal attention for that one. She was pleasantly surprised to discover that all of the other courses, those that are offered in distance learning mode, either via the WWW or video-tape, will also be moderated in person by qualified full-time or adjunct faculty from the University of Stuttgart, should she so desire.

She shows the results to her manager, Elsa, who looks at the cost. She notes that the price is comparable to courses at other universities that are nearby, but they do not have any comparable courses. Distance learning courses are only about 15% higher than those offered at the university, if attending in person. Of course, it is not feasible to attend the University of Queensland in person! So Elsa gives her "OK," knowing that Anna will take the course on her own time, but that the company will reimburse her for all costs. Elsa is a very good manager and realizes that this investment in her people will pay very nice dividends to her group and to her employer. Anna immediately signs up, via the WWW, for the local one from the University of Stuttgart, and the distance learning one from the University of Michigan-Dearborn – the latter is available on the WWW and has lectures, streaming video, e-mail, and discussion groups all available asynchronously.

Once she enrolls as a student at ISEUC, Anna can take courses at any of the 100+ universities around the world which are part of the consortium, and that offer high-quality and timely courses and modules of high relevance to her and to her employer. She orders her textbooks on-line and they arrive within a few days. For the University of Stuttgart course, she has the option of going to class or taking it via distance learning. For the University of Michigan-Dearborn course, the only choice is distance learning. During the first distance learning class meeting, there are the usual initial technical and logistical snafus as the professor greets his students locally as well as across the world. For some of the latter ones, the "greeting" is done asynchronously, but it is not long before he knows all of his students by name and face and vice versa. Within the first few weeks of the course, Anna finds herself as part of a virtual team of students working on a software user interface design. Her team is composed of students such as herself, and they are working for DaimlerChrysler in Strathclyde, EDS in The Hague Netherlands, and for Motorola in Auckland, New Zealand. There is even a fellow Ford student in Dearborn, Michigan, who is taking the course "live." She is struck by how much this design team of students resembles the virtual teams of which she is part in her work life. Whenever she has questions during the design project or at any time during the course, she can ask her fellow students, either via e-mail, chat mode, or on the class discussion bulletin board. Some of the team members even have low-cost desktop video conferencing equipment. If the other students are not helpful, then she can either go to the University of Stuttgart or place a phone call or e-mail to the instructor who was designated on the syllabus from University of Michigan-Dearborn. For

videotape portions of the course, this instructor is also available to help answer questions. Anna is pleased that ISEUC offers such a wide range of options for helping her learn some pretty difficult subjects.

Exams – ugh – are still a part of each credit course. A proctor from Ford at Aachen is available to hand out the exams, answer simple questions, and collect them. More complex questions can be answered live via the chat mode available with the "local" instructor. The results of the exam are then sent to the professor either via FAX or scanned and sent electronically. Anna gets her grade promptly, and she can also look at the secure course web-site, using her PIN, to see how she did compared to her classmates.

Homework, projects, and other assignments are all posted to the course web-site. That is also where Anna looks to determine what she should be reading, what other students think (as recorded on a bulletin board), and when the exams will be given. She can also check her current grades at any time, using her PIN.

Eventually, the course is over, and the final exam is handed out and taken, with a proctor present. Within a week, Anna is notified that she has passed with a A- grade! An end-of-course survey is available for Anna to make recommendations about what she liked and what needed improvement. The survey is via a WWW-enabled database, so she can see immediately what her classmates think as well. Her grade arrives via the WWW and she takes it to Elsa, who then initiates the paperwork to reimburse the registration fee to Anna. Elsa congratulates her employee on her good work and her conscientiousness in seeking to become a more talented and useful member of Elsa's team. She inquires if Anna plans to take any more courses this way, and receives a strong "Jawohl, natürlich!" Elsa decides to try some courses herself <u>and</u> encourage other members of her work group to check out ISEUC!

Of course, Anna would like to have **all** of the courses available to her anytime she wants -- on a 24 x 7 basis -- but she also realizes the value of learning as part of a community. Better yet would be to have the professor sitting right with her and helping her learn most effectively and efficiently. Maybe someday, technology will permit such a clone of Plato and Aristotle, but until then, the combination of distance and traditional learning modes available from ISEUC provides opportunities that would not be possible otherwise.

Similar scenarios for other countries, universities, degrees [B.S., M.S., Ph.D.], non-credit courses, certificates and modules could be used.

REFERENCES

1. Freeman, P. and W. Aspray, The Supply of Information Technology Workers in the United States, Computing Research Association, 1999, as adapted from U.S. Degree Programs in Computing, in *Computing Professionals – Changing Needs for the 1990s*, National Academy Press, 1993.

2. IEEE, *IEEE Standards Collection: Software Engineering*, IEEE Standard 610.12-1990, IEEE, 1993.

3. Knoke, P., Graduate SE Program Survey Results & Evaluation, 8 (9), September, 1998, *Forum for Advancing Software Engineering Education,* On-line at http://www.cs.ttu.edu/fase.

4. Naur, P. and B. Randall (eds.), *Software Engineering: A Report on a NATO Conference,* Sponsored by the NATO Science Committee, NATO, 1969

5. Parnas, D., Software Engineering: An Unconsummated Marriage, *ACM Software Engineering Notes*, November, 1997, pp. 1-3.

6. Speed, J., Software Engineering, *Licensure Exchange*, Texas Board of Professional Engineers, 2 (3), June, 1998, pp. 1, 16.

APPENDIX B.2

Results to Date on Universities: Software Engineering Programs

Abbreviations: CS=Computer Science; CIS=Computer and Information Science; SE = Software Engineering; ECE=Electrical and Computer Engineering; IT: Information Technology; CSE: Computer Science and Engineering

UNIVERSITY	COLLEGE/SCHOOL:DEPT	LEVEL	TITLE OF DEGREE
Auburn University	College of Engineering: CS and SE	B.Sw.E.	SE
Auburn University	College of Engineering: CS and SE	M.Sw.E.	SE
Auburn University	College of Engineering: CS and SE	M.S.	CS and SE
Auburn University	College of Engineering: CS and SE	Ph.D.	CS and SE
Australian National University	Faculty of Eng. And IT: CS	B.Sw.E	SE

Australian National University	Faculty of Eng. And IT: CS	Bachelor of IT	SE
Butler University	Liberal Arts & Sciences: CS and SE	B.S.	SE
Cal Poly-San Luis Obispo	College of Engineering: CS	B.S.	Currently proposing
California State University, Fresno	College of Engineering & CS: CS	B.S.	CS with SE option
California State University, Hayward	School of Science: Math and CS	B.S.	CS with SE option
Calif. State University, Northridge	College of Engineering and CS	B.S.	CS with No SE option
Calif. State University, Sacramento	College of Engineering and CS: CS	M.S.	SE
Carroll College	Undergraduate: CS	B.S.	C.S. with SE option
Carroll College	Graduate: CS	M.S. (sent to NCA)	SE
Carnegie Mellon University	School of Computer Science: Institute for SW Research Intl	Master	SE
Carnegie Mellon University	School of Computer Science: Institute for SW Research Intl	M.S.	IT, SE concentration (Dist. Learn. ONLY)
Colorado Technical University	: CS	M.S.	CS: SE concentration
East Tennessee State University	College of Applied Science and Technology: CIS	M.S.	CS with SE concentration
Embry-Riddle University	Dean of Academics:Comp. and Math	M.S.	SE
Florida A&M University	: CIS	M.S	SE Science
Florida State University	College of Arts and Sciences: CS	B.S/B.A	CIS with major in SE
Florida State University	College of Arts and Sciences: CS	Master of Science/Arts	CIS with major in SE
Gannon University	School of Engineering and Computer Science: ECE	B.S.	EE/SW conc., embedded focus
Gannon University	School of Engineering and Computer Science: ECE	M.S.	Embedded SE
Gannon University	School of Engineering and Computer Science: ECE	M.S.	EE/embedded Software conc.
George Mason University	School of IT & Engineering: Information and SE	M.S.	SE
George Mason University	School of IT & Engineering: Information and SE	Ph.D.	IT, with SE specialization
Kansas State University	College of Engineering: CIS	M.S.	SE
McMaster University	Faculty of Engineering: Computing and Software	B.E.	
Mercer University	School of Engineering: Electrical and Computer Engineering	M.S.E.	SE
Mercer University	School of Engineering: Electrical and Computer Engineering	M.S.	SE
Milwaukee School of Engineering	Engineering (not really a separate college): EECS	B.S.	SE

Mississippi State University	College of Engineering: CS	B.S.	SE
Monash University	Faculty of IT: School of CS & SE	B.S.	SE
Monmouth University	School of Science, Technology and Engineering: Software and EE	B.S.	SE
Monmouth University	School of Science, Technology and Engineering: Software and EE	M.S.	SE
Murdoch University	Division of Science and Engineering: School of Eng.	B.E.	SE
Murdoch University	Division of Science and Engineering: School of Engineering	B. Eng.Sc	SE
Murdoch University	Division of Science and Engineering: School of Eng.	M. Eng.Sc	SE
Nat. Univ. of Ireland, Galway	Faculty of Engineering: Electronic	B.E.	Electronic and CE
Naval Postgraduate School	CIS and Operations Division: CS	M.S.	SE
Naval Postgraduate School	CIS and Operations Division: CS	Ph.D.	SE
Oregon*:OU, OSU, PSU, Grad. School	Engineering, except OU-Arts & Sciences: CS	Master	SE
Polytechnic Univ-Chimborazo:ESPOCH	College of Computer Software Systems Eng.: School of CS	CS System Engineer	SW Systems
Polytechnic Univ-Chimborazo:ESPOCH	College of Computer Software Systems Eng.: School of CS	Master of CS Applied	SW Systems Applied
Rochester Institute of Technology	College of Engineering & College of App. S&T: SE	B.S.	SE
Santa Clara University	College of Engineering: CE	M.S.	SE
Seattle University	College of Science and Engineering: CS AND SE	M.S	SE
Slovak University of Technology	Faculty of EE and IT: CS	Bc.	Informatics/SE conc.
Slovak University of Technology	Faculty of EE and IT: CS	Ing.	Informatics/SE conc.
Slovak University of Technology	Faculty of EE and IT: CS	Ph.D.	SW & Inf. Sys.
Southern Polytechnic State University	College of Arts and Sciences: CS	M.S	SE
Southern Methodist University	School of Engin. & App. Sci.:CSE	M.S.	SE
Stevens Institute of Technology	School of App. Sci. & Lib Arts: CS	B.S.	SE focus
Swinburne University of Technology	School of IT: no faculties	Bachelor	SE
Swinburne University of Technology	School of IT: no faculties	Bachelor	App. Sci. (CS & SE)
Swinburne University of Technology	School of IT: no faculties	Master	IT, SE concentration
Swinburne University of Technology	School of IT: no faculties	Doctor of Philosophy	SE concentration
Texas State Technical College	: Computer/Graphics	A.A.S.	SE Technology

Texas Tech University	College of Engineering: CS	M.S	SE
Ume University	: CS	M.S.	CS
Ume University	: CS	Ph.D.	CS
Universidad Autonoma de Madrid	Computer Science School: Computer Science Engineering	Ingeniero	Informatica
Universidad Autonoma de Madrid	CS School: CSE	Doctor	Informatica
University of Auckland	School of Engineering: CS	Bachelor of Engineer.	SE
University of Auckland	Science Faculty: Electrical and Electronic Engineering	Ph.D.	Any field, by thesis only
University of Calgary	Faculty of Science: CS	B.Sc.	CS: SE spec. planned
University of Calgary	Faculty of Science: CS	M.Sc.	CS: SE spec. - thesis/course
University of Calgary	Faculty of Science: CS	Ph.D.	CS: SE spec. - thesis/course
University of Melbourne	Faculty of Engineering: CS & SE	Bachelor of Engin.	SE
University of Michigan-Dearborn	College of Engineering and CS: CS/ECE	M.S	SE
University of Michigan-Dearborn	College of Engineering and CS: CS	M.S in CIS, with SE option	CIS
University of Michigan-Dearborn	College of Engineering and CS: CS	B.S.	SE
University of Missouri-Kansas City	: CS Telecommunications	B.S.	CS: SE concentration
University of Missouri-Kansas City	: CS Telecommunications	M.S.	CS: SE concentration
University of Missouri-Kansas City	: CS Telecommunications	Ph.D.	CS: SE concentration
University of Nebraska	College of Engineering: CS and Engineering	M.S	SE
University of Ottawa	Faculty of Engineering: School of IT & Engineering	Bachelor of Applied Science	SE
University of Queensland	Faculty of Engineering, Physical Science & Architecture: CS & EE	Bachelor of Engineering	SE
University of Scranton	Graduate School: Comp. Sciences	M.S.	SE
University of Strathclyde	Faculty of Science: CS	B.S.	SE
University of St. Thomas	School of Sci. and Engin. Grad Pgms	M.S.	SE, IT, IS
University of Stuttgart	: Informatics	Diplom	-Informatiker (in)
University of Wales, Aberystwtyh	Faculty of Science: CS	B. Engineering	SE
University of Wales, Aberystwtyh	Faculty of Science: CS	M. Engineering	SE
University of Washington, Bothell	:Computing & SW Systems Program	B.S.	Computing & SW Sys.
University of Wisconsin-Platteville	College of Engineering, Math and Science: Electrical & SE	B.S.	SE