

Electrical, Computer and Software Engineering

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Time

Science

Production of
Goods and Services

Engineering

□ Antiquity

- ▶ Mathematics,
- ▶ Philosophy
- ▶ Chemistry,
- ▶ Physics

■ **Craftsmanship:**

- * *Artisans*
- * *Guilds*

● XVIII Century

- ▶ Biology,

Industrial Revolution:
mechanization of industry;
late 1800s - early 1900s

☞ **Military Eng..**

☞ Civil Eng..

□ XIX Century

■ **Industry:**

- Engineers/
Product Develop.
- Capitalists
- Workers

☞ Mechanical Eng..

☞ Chemical Eng..

□ XX Century

☞ **Electrical Eng..**

↓ **ELG, CEG, SEG**

INDUSTRY

ENGINEERING
Methodologies for the application of the scientific principles to industrial production :

- Team effort for design and production;
- Mass production;
- Design for portability and maintainability;
- Standards (..ISO9000) for documentation and quality assurance,..

SCIENCE
MATH,
PHYSICS,
CHEMISTRY

Electrical (Electric Power Production & Utilization)

Electronics (Communications, Instrumentation, Control, ...)

Electronic Computers
- *general purpose industrial-produced HW & artisan-crafted SW* (OS, HLL compilers)

Computer-Based Systems
- *application specific systems integrating general purpose industrial-produced HW & artisan-crafted SW* (OS, HLL compilers, & application-specific programs)

SOFTWARE ENG. (SE) : To support industrial-produced application-specific SW

COMPUTER SCIENCE

Math,
Electricity

Math
(Bool
Alg..)

?? Computer Programming Theory

Math (Formal Logic, Process Algebra, ...)

Joint IEEE Computer Society and ACM Steering Committee for the Establishment of Software Engineering as a Profession

<http://www.computer.org/tab/seprof/>

- ★ Education Task Force
B.H. Barnes, IEEE/CS
G.L. Engel, IEEE/Cs Co-Chair
M.L. Griss, ACM
R. LeBlanc, ACM Co-Chair
T. Wasserman, ACM
L. Werth, IEEE/CS

Draft 2/8/98: Accreditation Criteria for Software Engineering:

- Faculty Requirements
- Curriculum
- Laboratory and Computing
- Students
- Institutional Support

- ★ **Software Engineering** encompasses (i) theory, (ii) technology, (iii) practice and application of software in computer-based systems;

▶ *IEEE/ACM ...Draft 2/8/98 Accreditation Criteria for Software Engineering:*

SOFTWARE ENGINEERING CURRICULUM

- ❑ (3/16) Software Engineering
 - ❑ (3/16) Computer Science & Engineering
 - ❑ (3/16) Appropriate Supporting Areas
 - ❑ (3/16) Topics
 - ❑ (1/4) Institutional Requirements and Electives
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▶ *IEEE/ACM ...Draft 2/8/98 Accreditation Criteria for Software Engineering:*

 **Software Engineering_Topics:**

- Software Architecture
 - System Performance
 - Testing and Quality Assurance
 - Requirements Engineering
 - Management of Software Processes
 - Selection and Use of Software Tools and Components
 - Computer and Human Interaction
 - Documentation
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▶ *IEEE/ACM ...Draft 2/8/98 Accreditation Criteria for Software Engineering:*

 **Computer Science & Engineering Topics :**

- Algorithms
 - Computer Architecture
 - Databases
 - Programming Languages
 - Operating Systems
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 **Appropriate Supporting Areas :**

- Communications (oral, written, listening) including the abilities to work in teams
 - Mathematics (Discrete Mathematics, Probability and Statistics,..)
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▶ *IEEE/ACM ...Draft 2/8/98 Accreditation Criteria for Software Engineering:*

★ **Advanced Topics:**

- Provide depth in one or more areas of SE
 - Should include work in one or more significant application domains
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❖ The program must include components of software development involving all aspects of the software life cycle.

❖ The program must include a **meaningful major project** which integrates most of the other aspects of the curriculum.
