



Ethical Issues in Science, Research & Engineering

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What is Ethics?

(What is Engineering & Research Ethics?)

- The systematic attempt to answer moral or ethical questions (regarding science & research)
 - Ethical analysis (of research ethical issues)
 - Ethical theories/ideals/values (applied to S & R)
 - Ethical review (of S & R)
 - Ethical codes (for S & R)
- Main areas of ethical inquiry regarding science and research

Aims/goals Restrictions Priorities

what is good/bad? what is (im)permissible? What is more important?

Scientists Scientific Community

Society



Basic Questions & Perspectives

- Why do S, R & E? ==> *aim/goal*
- S, R & E about what? ==> *priorities*
- Forbidden knowledge? ==> *restrictions*
- S, R & E how? ==> *restrictions*
- Evaluating results ==> *priorities*
- Handling results ==> *priorities & restrictions*
 - communication
 - application
 - actual use

PERSPECTIVES

Intra-science/engineering

From within the
scientific community

Extra-science/engineering

From the point of
view of society



Specific Aspects of Engineering Research

Engineering is a practice, not only a science

Engineering research is to serve the practice, and that practice is motivated by other things than love of knowledge

Societal & political goals (health, economy, stability)

Not harming people (unnecessarily)

Respecting people (autonomy, integrity, justice)

Private interests

At the same time: these values have been balanced and applied differently through history



The Historical Roots of Technological Research Ethics

Technology has been seen as potentially problematic from day 1 of the modern scientific revolution

The Nazi experiments (later revealed, also Soviet, Japanese and the US): ... post WW2

Nuclear weapons: post WW2 ... 1950's, -60's

Environmental concerns ... 1960's, 70's

Use of technology for oppression, violence, war ... 1970's

Long term potential risks of great significance (gene tech, nano tech, synbio, geo engineering, computer tech) ... 1970's, -80's

Surveillance, control & manipulation ... 1990's

