Industry Standards

ENG101 Engineering Professionalism

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Law – a balanced outlook

Law in Engineering Experimentation?

Minimal Compliance:
- *handbook mentality*
- *repetition of mistakes*

Continuously Changing Law:
- *overburdening of rules*
- *law lags behind the technology because of faster innovation*
- *two-way pressure*

Rules for responsible experimentation, not rules of game

Empowering law-making and inspection agencies

Specific rules vs broader regulations

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Law – a balanced outlook

Good laws when effectively enforced, clearly produce benefits

Reasonable minimal standards of professional conduct

Powerful support and defence

Precise rules and enforceable sanctions are appropriate in cases of ethical misconduct that involve violations of well-established and regularly reexamined engineering procedures that have as their purpose the safety and well-being of the public.

Rules must not attempt to cover all possible outcomes of an experiment, nor must they force engineers to adopt rigidly specified courses of action – broad regulations, professional societies.

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Industrial Standards

Greater specificity

Interchange of components

Ready-made substitution for lengthy design specification

Decrease product cost as a thorough design is sometimes not required

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Industrial Standards

Types of standards

Criterion	Purpose	Selected examples
Uniformity of physical properties and functions	Accuracy in measurement, interchangeability, ease of handling	Standards of weights, screw dimensions, standard time, film size
Safety and reliability	Preparation of injury, death, and loss of income or property	National Electric Code, boiler code, methods of handling toxic wastes
Quality of product	Fair value for price	Plywood grades, lamp life
Quality of personnel and service	Competence in carrying out tasks	Accreditation of schools, professional licenses
Use of accepted procedures	Sound design, ease of communications	Drawing symbols, test procedures
Separability	Freedom from interference	Highway lane markings, radio frequency bands
Quality procedures approved by ISO, the International Standards Organization	Assurance of product acceptance in member countries	Quality of products, work, certificates, and degrees

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Technical/Engineering Standards

Technical Standard: an established norm or requirement.

A formal document that establishes uniform engineering or technical criteria, methods, processes and practices.

The documents prepared by a professional group or committee which are believed to be good and proper engineering practices, and which contain mandatory requirement.

Thousand of standards in use around the world

Cover everything from the simplest screw thread to the most complex information technology network

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Technical/Engineering Standards

Organizations can ensure that consistent, compatible, safe and effective products and services

International sales and utilization

Use of off-the-shelf components, devices, instruments, tools and equipment

Standardization Process (ISO Example):

Formation of a technical committee that is responsible for a specific subject area.
Development of a draft to meet a specific market need.
Open for comments and further discussion.
Voting process for consensus
Agreement Reached: draft is converted to an ISO standard
Agreement Not Reached: further modification of the draft for next voting round

Developing a standard usually takes about 3 years

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References

1. Zhu, Q., Martin, M. W., & Schinzinger, R. (2022). *Ethics in engineering*.
2. https://www.georgiasouthern.edu/cec/ece/engineering-standards/

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