

Module: Copyright in Environmental Engineering

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(*) Action: C = Creation, I = Insert, U = Update, R = Replace, D = Delete

REFERENCED DOCUMENTS

ID	Reference	Title
1	2020-1-UK01-KA201-078934	IPinSTEAM Proposal
2		

APPLICABLE DOCUMENTS

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1		
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1. Copyright in Environmental Engineering

1.1 Learning Outcomes

Design ideas or concepts are not protected by copyright, but the expression of those ideas or concepts may be protected. The engineer who expresses the idea or concept in the form of plans or drawings may obtain copyright protection. When a work is completed, it is automatically protected by common law copyright.

A license is merely a grant of permission by the owner of the rights in the work to another entity. These agreements allow the engineer to retain ownership of the copyright, and can provide for the owner's ability to modify the work and use the work in future projects.

After completing this module, you will be able to:

- Understand what copyright law is in field of Environmental Engineering
- Learn the importance of copyright law in Environmental Engineering

Estimated seat time: 1 hour in a classroom of 25-30 students.

1.2 Main Content

1.2.1 Terms and Definitions

Copyright law protects original expression in field of Environmental Engineering. The objective of copyright law is to stop others copying or adapting their work. The Copyright Law provides procedures that allow the copyright owner to enhance the protection, for e.g. to the category of "architectural works," which can include engineering plans and drawings. The work must also be "original," defined as "independently created by its author" and possessing "some minimal degree of creativity."

Owners are increasingly demanding that engineers do not retain absolute ownership over the work. Frequently, the owner's needs can be met through the issuance of a nonexclusive license by the engineer to the owner. The agreement can require the owner to indemnify the engineer for any claims or damages arising from the owner's negligence in modifying the work.

The owner of a copyright in engineering plans enjoys three basic rights:

- (1) the right to reproduce the plans;
- (2) the right to prepare derivative works based on the plans;
- (3) the right to build the structure depicted in the plans.

The copyright owner also enjoys the right to prevent others from exercising these rights.

Engineers should view their plans and drawings to protect this intellectual property and should establish intraoffice procedures to defend the firm against allegations of copyright infringement from other engineers. Copyright can protect the engineer's work, but the proper procedures should be followed to retain ownership and ensure compliance with the Copyright Law.

The engineer should decide what should be Copyright protection may extend to non-building objects such as mechanical devices and electronic components.

1.2.2 Theory behind the IP implementation

In line with the EU's Duration Directive¹⁵, Romanian copyright law grants a general term of 70 years post mortem and a general term of 50 years in the field of related rights. The terms of protection which are currently in place are reviewed in the following in more detail. However, in view of the different terms of protection, it is again important to distinguish between copyright and related rights.

The Copyright Law also provides for exceptions and limitations to the exercise of copyright, such as the use of a work previously published or the reproduction, distribution, broadcasting or communication to the public of a work, without authorization from the right holder, in certain cases and provided that certain conditions are met (such as being devoid of direct or indirect commercial or economic advantage and/or giving proper attribution whenever possible).

Engineering is the ultimate human endeavor, creating solutions to the world's challenges and designing the products that support our quality of life.

The **National Academy of Engineering** has identified six important engineering "habits of mind": creativity, optimism, systems thinking, collaboration, communication and ethical considerations. These six ways of seeing the world are essential for all 21st century citizens.

Teaching Engineering makes engineering easy and hands-on for students of all grade levels because:

- Engineers are creative problem solvers.
- Engineers make a world of difference.
- Engineering is essential to our health, happiness and safety.
- Engineers help shape the future.

1.2.3 Practical examples

With rapid population growth, urbanization, and climate change, our world is facing challenges to ensure environmental and human systems thrive. Environmental engineers find solutions to the world's largest problems.

The application of science and engineering knowledge and concepts will care and restore our natural environment and will solve environmental problems. Students need practical examples of the types of problems that environmental engineers solve, specifically focusing on air and land quality issues. Air quality topics include air pollution sources, results of poor air quality including global warming, acid rain and air pollution, as well as ways to reduce air pollution.

Environmental engineering spans many disciplines, but is generally broken into a few subfields: math, physics, chemistry, along with understanding of environmental sciences such as biology, water chemistry, hydrology and atmospheric science.

Environmental engineers work in a variety of organizations, including:

- public utilities oil and gas production firms
- construction companies
- consulting firms
- local, federal or international governing bodies

- environmental non-profit organizations.

Environmental engineers learn about how contaminants move through different ecosystems, how to design for sustainability, and the importance of life cycle assessment.

Environmental engineers gain expertise in how to design water and wastewater treatment systems, how to reduce air pollution and how to remediate sites impacted by hazardous materials.

Environmental ethics builds on scientific understanding by bringing human values, moral principles, and improved decision making into conversation with science.

1.2.4 Case studies

In the lesson plan that accompanies this module the case that students work on Engineering Ethics, it is about Copyright Concerns.

A follow-up case study is proposed to be as follow:

SC PRO IT is a large company that sells computers, computer components, and software. Dan is hired as an entry-level software engineer at SC PRO IT. His first project was to assist in writing the code for SC PRO IT's new hard disc controller. He had previously worked on a similar system interning at a start-up and had written a code which greatly enhanced the performance of their product. Dan quietly re-uses this same code in the SC PRO IT product, and does not think to tell anyone that he has used the code from his last job. His manager is thrilled with the speed improvements this code brings to the product.

Before the product is released, it has to undergo a four-month long quality assurance process review. During the review of the product, it was found the code which Dan developed had been copyrighted by the startup he had previously worked for. Even though Dan had developed the code, his previous company still owned the intellectual property rights to it.

When his manager informed Dan of the problem, Dan admits he did not realize he had made a mistake because he was not familiar with copyright laws. Dan then goes on to explain that the start-up he used to work for is now out of business and is unsure if SC PRO IT would be able to get in contact with the owner of the copyright. If SC PRO IT can't use Ralph's code, then it will have to rewrite the entire code of the product, delaying its release by many months. What should they do?

(Source: [Copyright Concerns - Markkula Center for Applied Ethics \(scu.edu\)](https://www.scu.edu/ethics/copyright-concerns/))

A debate and around the classroom discussion can be initiated on topics like: How do you feel about it? What we can do in that situation?

1.3 Knowledge Assessment

A short quiz of about 7 key questions that can be used to check the learners' knowledge acquisition. Correct answers can be marked in bold.

Quiz: Please mark the correct answer with bold when required. Include 10 questions for your module. Increase gradually the level of difficulty.

Question 1: Copyright policy as a medium to protect the rights of the authors in sharing, disseminating and maximizing the influence of their research works. **[True]** [False]

Question 2: The Copyright Law provides procedures that not allow the copyright owner to enhance the protection. [True] **[False]**

Question 3: The application of science and engineering knowledge and concepts care and restore our natural environment and to solve environmental problems. **[True]** [False]

Question 4

Environmental engineers find solutions to the world's largest problems. **[True]** [False]

Question 5: Environmental ethics applies moral thinking to the natural world and the relationship between humans and the earth. **[True]** [False]

Question 6: Climate, weather, and natural resources that affect human survival and economic activity. **[True]** [False]

Question 7: Copyright can protect the engineer's work. **[True]** [False]

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