Journal of Architectural Engineering Technology

Mini Review **Open Access**

A Brief Overview about Architectural Engineering

Dr. Kyoung Sun Moon*

Department of Architecture and Design, Yale University, United State

Abstract

Architectural engineering, also known as building engineering, is an engineering discipline that deals with the technological aspects and multi-disciplinary approach to planning, design, construction, and operation of buildings, such as analysis and integrated design of environmental systems. Architecture is the science of designing buildings and other physical structures. The course mainly deals with the artistic aspects of a building and focuses less on the mathematical aspects of a building.

Introduction

An architectural engineer applies the skills of many engineering disciplines to the design, construction, operation, maintenance, and renovation of buildings while paying attention to their impacts on the surrounding environment. In countries susch as Canada, UK, and Australia, architectural engineering is more commonly known as Building engineering, building systems engineering, or building services engineering. In some languages, such as Korean, "architect" is literally translated as "architectural engineer" [1].

With the establishment of a separate NCEES Professional Engineering registration examination in the 1990s, architectural engineering is now recognized as a distinct engineering discipline in the United States. But many practicing 'architectural engineers' hold degrees or registration in civil, mechanical, electrical, or another engineering field and become architectural engineers via experience. Conversely, many degree-holding architectural engineers have professional registration in civil or mechanical engineering, for example. The number of architectural engineering degree programs is increasing [2].

Architectural engineers' roles can overlap with that of the architect and other project engineers. Like architects, they seek to achieve optimal designs within the overall constraints, except using primarily the tools of engineering rather than architecture [3]. In most parts of the world, architectural engineers are not entitled to practice architecture unless they are also licensed as architects. In some jurisdictions, registered professional architectural engineers are limited, by virtue of the exams taken, to practicing only one or more of the component areas of building engineering practice such as mechanical (HVAC/plumbing/etc.), electrical, structural, or fire protection [4].

In recent years there has been increasing emphasis on sustainable and green design, including in engineered building systems. Architectural engineers increasingly seek LEED ((R) USGBC) Accredited Design Professional (LAPD) status in addition to their Professional Engineering registration [5].

Architectural engineers apply science and technology to the real world by designing buildings that enhance our standard of living and improve our quality of life. They do this by combining building systems – structural, electrical, mechanical, lighting, acoustics and fire protection - into an integrated whole

What is the difference between an architect and an architectural engineer?

The key difference between an architect and an engineer is that an architect focuses more on the artistry and design of the building, while the engineer focuses more on the technical and structural side. Architects design a structure by considering the customer's needs and requirements [6].

One of the many reasons why this course is one of the best is that Architectural engineering as a single integrated field of study which means that it has an integrated course which helps us to learn various things side by side with our ongoing studie. Its multi-disciplinary engineering approach is what differentiates architectural engineering from architecture (the field of the architect): which is an integrated, separate and single, field of study when compared to other engineering disciplines [7,8].

Through training in and appreciation of architecture, the field seeks integration of building systems within its overall building design. Architectural engineering includes the design of building systems including engineering practice such as mechanical (HVAC/plumbing/etc.), electrical, structural, fire protection, structural systems. In some university programs, students are required to concentrate on one of the systems; in others, they can receive a generalist architectural or building engineering degree [9].

An architectural engineer uses the latest scientific knowledge and technologies to design and develop structurally sound buildings that add value to a community. In their work, they consider essential factors like comfort, sustainability and safety [10]. By understanding the roles and responsibilities of an architectural engineer, you can decide if it is the right career for you. In this article, we discuss what an architect engineer is, how they differ from architects, how much they earn, what type of jobs they can pursue and share a step-by-step guide for how to start a career in architectural engineering.

An architect engineer often performs the following job duties:

- Discussing project requirements with clients

- Setting work goals and budget for a project

*Corresponding author: Dr. Kyoung Sun Moon, Department of Architecture and Design, Yale University, United State, E-mail: Dr.KyoungSunMoon@gmal.com

Citation: Moon KS (2022) A Brief Overview about Architectural Engineering. J Archit Eng Tech 11: 310.

Citation: Moon KS (2022) A Brief Overview about Architectural Engineering. J Archit Eng Tech 11: 310.

Page 2 of 3

- Visiting the project site to understand exact requirements

- Conducting surveys of the construction site

- Drafting project blueprints

- Designing and developing structures and prototypes

- Analysing, identifying and resolving design problems

- Ensuring the functionality and safety of building systems

- Obtaining environmental reports and work permissions

- Complying with building and environmental regulations

- Training and assisting team members to achieve project objectives

- Coordinating with different vendors regarding materials, devices and equipment

- Collaborating with engineers, architects, consultants and other professionals

- Supervising the construction work to achieve set work goals

- Keeping clients informed and updated on project developments

- Completing the project on schedule

The differences between an architect and an architectural engineer are as follows:

- While architects focus on designing a building as per client requests, architectural engineers focus on the engineering aspects of the building [11].

- Architects consider aesthetic, spatial and functional design principles when drafting structural designs, while architectural engineers give more attention to engineering principles for planning, designing and constructing buildings.

- An architect may aim to create building designs that adhere to client requests, while an architectural engineer may be more concerned about the structural safety and stability of the building. They install electrical, lighting, ventilation, air conditioning and plumbing systems and may even tackle any acoustic planning and energy conservation issues [12].

Architectural engineers apply practical and theoretical knowledge to the engineering design of buildings and building systems. The goal is to engineer high-performance buildings that are sustainable, resilient, economically viable, that ensure the safety, health, comfort, and productivity of occupants.

Uniting scientific principles from structural, mechanical, electrical, lighting, acoustical, and construction engineering, architectural engineers apply their discipline-specific expertise to conceptualize, design, construct, operate and maintain built environments in interdisciplinary team environments [13].

Graduates of architectural engineering are widely considered to be creative systems engineers, with formal training in creativity and design through architectural design studios married with a solid engineering education.

Discussion

Architectural engineers have a lasting impact on society. Because people spend 86% of their time in indoors, architectural engineers concentrate on indoor building environments that prioritize the human condition and well-being of society. They also promote sustainable practices by lowering energy consumption and occupants' carbon footprint, so much so that architectural engineering has been identified as the discipline with the highest potential to combat climate change.

The employment opportunities for architectural engineers are endless and wide-ranging! Graduates regularly accept job offers from architectural engineering firms, consulting engineering firms, real estate developers, building equipment designers, manufacturers, designers and producers of building materials and products, facilities engineering and management groups, building owners, specialty contractors, forensic engineering consultants, building technology consultants, software developers, contractors, and construction managers. Other non-traditional employment fields for architectural engineers are in finance, outer space construction, government and policymaking, code developing, and much more. Many Penn State AE alums are in key positions in their firms or even own their own businesses [14].

First of all, what is architectural engineering? The primary responsibility of an architectural engineer is to focus on a building's engineering aspects. A person in this role designs the mechanical and structural systems of a building, as well as managing challenges that arise with its electrical and lighting systems. Although architectural engineers work with architects, they are strictly engineers. This type of career tends to appeal to people with strong science and math skills who are interested in the building process.

Entry-level architectural engineering jobs typically require a minimum of a Bachelor in Science (BSc). This degree takes most people four years to complete if they are able to devote themselves to full-time study. The Bachelor of Science degree in this discipline focuses almost exclusively on coursework needed for careers in architectural engineering, and minimally on general requirements.

Conclusion

Two of the primary responsibilities of an architect are to design buildings and continually manage highly detailed construction projects. Educational requirements are greater in this role than they are for those pursuing architectural engineering jobs. Although a Bachelor of Science in Architecture is the minimum requirement, most employers prefer candidates who have completed a master's degree. In the US, colleges offering architecture programs provide students with the option of enrolling in a five-year Bachelor of Architecture with an intense focus on design, technology and architecture history. After fulfilling all college requirements, students are eligible to take the Architect Registration Examination for licensing as a professional architect.

Acknowledgment

Conflict of Interest

None

References

1. Evans GW, RE Wener (2007) Crowding and personal space invasion on the train: Please don't make me sit in the middle. J Environ Psychol 27: 90-94.

2. Brierley Newell P (1995) Perspectives on Privacy. J Environ Psychol 15: 87-104.

Citation: Moon KS (2022) A Brief Overview about Architectural Engineering. J Archit Eng Tech 11: 310.

3. Ramsden E (2009) The Urban Animal: population density and social pathology in rodents and humans. Bull World Health Organ 87: 82.

4. Fischer GN, C Tarquino, JC Vischer (2004) Effects of the self-schema on perception of space at work. J Environ Psychol 24: 131-140.

5. Edwards MJ, WG Gjertson (2008) La Maison de Verre: Negotiating a Modern Domesticity. J Inter Des 34: 15-37.

6. Brewer Johanna, Dourish Paul (2008) Storied spaces: Cultural accounts of mobility, technology, and environmental knowing. International Journal of Human-Computer Studies. Int J Mob Hum Comput Interact 66: 963-976.

7. Mackenzie NE, MA Wilson (2000) Social Attributions Based on Domestic Interiors. J Environ Psychol 20: 343-354.

8. Edwards Clive (2013) Complete House Furnishers: The Retailer as Interior Designer in Nineteenth-Century London. J Inter Des 38: 1-17.

9. Newman A, Dennis C, Zaman S (2007) Marketing images and consumers' experience in selling environments. J Mark Manag 17: 136-150.

10. Kim JB, Koo Y, Chang DR (2009) Integrated Brand Experience through Sensory Branding and IMC. Bus Manag Rev 20: 72-81.

11. Hinds Joe, Sparks Paul (2008) Engaging with the natural environment: The role of affective connection and identity. J Environ Psychol 28: 109-120.

12. Inauen Jennifer, Contzen Nadja, Frick Vivan, Kadel Philipp, Keller Jan, et al. (2021) Environmental Issues Are Health Issues. Eur Psychol 26: 219-229.

13. Ulrich Roger S (1984) View Through a Window May Influence Recovery from Surgery. Science 224: 420-421.

14. Egner Lars Even, Sütterlin Stefan, Calogiuri Giovanna (2020) Proposing a Framework for the Restorative Effects of Nature through Conditioning: Conditioned Restoration Theory. International Journal of Environmental Research and Public Health 17: 6792.