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Commentary

Engineering in Structural Systems and its Subfields

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ABOUT THE STUDY

Structural engineering is a branch of civil engineering that trains professionals to develop the "bones and muscles" that give man-made structures their form and shape. Additionally, structural engineers need to comprehend and compute the stability, strength, rigidity, and earthquake-susceptibility of built structures for both buildings and non-building structures.

The structural designs are combined with those of other designers, like architects and building services engineers, and they frequently act as on-site supervisors for buildings being built by contractors. They may also work on the development of machinery, medical devices, and automobiles whose structural integrity has an impact on their usability and security. See the structural engineering glossary.

Specializations

All structural engineering pertaining to the design of structures is included in structural building engineering. It is a division of structural engineering that has a tight connection to architecture [1].

The main driving forces behind structural building engineering are the inventive manipulation of materials and forms as well as the underlying mathematical and scientific concepts to achieve an end that satisfies its functional requirements and is structurally safe when subjected to all the loads it could reasonably be expected to experience.

Architectural design, on the other hand, is driven by the imaginative manipulation of mass, space, volume, texture, and light to accomplish an objective that is beautiful, useful, and frequently artistic.

Structures designed to withstand earthquakes are known as earthquake engineering structures. Understanding how structures interact with trembling ground, predicting the effects of potential earthquakes, and designing and building structures that will hold up during an earthquake are the basic goals of earthquake engineering [2].

Base isolation, which permits the base of a structure to move freely with the ground, is one crucial component in earthquake engineering.

All structural engineering pertaining to the built environment is considered to be civil structural engineering. On these projects, the structural engineer serves as the principal and frequently the only designer [3,4]. Structural safety is of the utmost concern while designing such structures.

Extreme forces are frequently applied to civil engineering structures, such as wide temperature swings, dynamic loads from traffic or waves, or high pressures from water or compressed gases. They are frequently built underground, in corrosive conditions like the sea, or in industrial buildings [5].

Numerous mechanical structures can benefit from the structural engineering principles. While the design of movable or moving structures must take into account fatigue, variations in how load is resisted, and major deflections of the structures, the design of static structures assumes that they always have the same geometry [6].

The forces that various machine parts are subjected to can change greatly and do so quickly. Over the course of its lifespan, a boat or aircraft will be subjected to forces that vary greatly and occur thousands of times [7]. Such structures must be able to withstand such loading for the duration of their design life without failing, according to the structural design.

Launch vehicles, missiles, hypersonic vehicles, military aircraft, and commercial aircraft are all examples of aerospace structures [8]. Thin plates with stiffeners for the external surfaces, bulkheads, and frames to sustain the shape, as well as fasteners like welds, rivets, screws, and bolts, are the standard building blocks of aerospace structures.

A nanostructure is a structure that is smaller than a molecule but larger than microscopic structures. It is important to distinguish between the different nanoscale dimensions when describing nanostructures [9]. On the nanoscale, Nano textured surfaces only have one dimension, i.e., a surface thickness that ranges from

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0.1 to 100 nm. On the nanoscale, nanotubes have two dimensions; their length may be substantially longer than their diameter, which ranges from 0.1 to 100 nm.

REFERENCES

1. Jain M, Olsen HE, Paten B, Akeson M. The Oxford Nanopore MinION: delivery of nanopore sequencing to the genomics community. Genome Biol. 2016;17(1):1-1.
2. Lu H, Giordano F, Ning Z. Oxford Nanopore MinION sequencing and genome assembly. Genom Proteom Bioinform. 2016;14(5): 265-279.
3. Mikheyev AS, Tin MM. A first look at the Oxford Nanopore MinION sequencer. Mol Ecol Resour. 2014;14(6):1097-1102.
4. Castro-Wallace SL, Chiu CY, John KK, Stahl SE, Rubins KH, McIntyre AB, et al. Nanopore DNA sequencing and genome assembly on the International Space Station. Sci Rep. 2017;7(1): 18022.
5. Hoenen T, Groseth A, Rosenke K, Fischer RJ, Hoenen A, Judson SD, et al. Nanopore sequencing as a rapidly deployable Ebola outbreak tool. Emerg Infect Dis. 2016;22(2):331.
6. Xu F, Ge C, Luo H, Li S, Wiedmann M, Deng X, et al. Evaluation of real-time nanopore sequencing for Salmonella serotype prediction. Food Microbiol. 2020;89:103452.
7. Gigante CM, Yale G, Condori RE, Costa NC, Long NV, Minh PQ, et al. Portable rabies virus sequencing in canine rabies endemic countries using the Oxford Nanopore MinION. Viruses. 2020;12(11):1255.
8. Jain M, Koren S, Miga KH, Quick J, Rand AC, Sasani TA, et al. Nanopore sequencing and assembly of a human genome with ultra-long reads. Nature biotechnology. 2018;36(4):338-45.
9. Miga KH, Koren S, Rhie A, Vollger MR, Gershman A, Bzikadze A, et al. Telomere-to-telomere assembly of a complete human X chromosome. Nature. 2020;585(7823):79-84.