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Civil engineering deals with the design, construction, and maintenance of infrastructure and buildings. It's essential to remember the following key points for civil engineers to make construction work smoother while maintaining quality standards.Looking forward to seeing everyone at the meeting tomorow and discussin our strategies for the future of civil engineering. This field has a rich history dating back to ancient Egypt around 2950 BC when they built man-made marvels like the pyramids.The Golden Gate Bridge, Hoover Dam, and English Channel Tunnel would've been impossible without civil engineers who brought together innovative ideas and construction techniques. In today's world, civil engineering is crucial for building highways, railroads, sewers, airports, and more at affordable prices.The 2019 U.S. News & World Report named civil engineering the 16th best STEM job with high pay and low unemployment of 1.8 percent. However, there are concerns about a growing shortage of engineers, especially those above 55 years old.To address this, the Accreditation Board for Engineering and Technology(ABET) has approved 254 college programs for new civil engineers. Choosing an economical civil engineering degree program will help prepare our crumbling infrastructure for the future.Our researchers at Affordable Schools evaluated over 250 full-time civil engineering options with a focus on affordability. We used four-point rubric to grade each program based on in-state tuition costs, student-faculty ratios, graduation rates, and completion odds.Cleveland State University, The University of Toledo, Southern University and Agricultural & Mechanical College, Youngstown State University, and Arkansas State University ranked among the top affordable colleges for civil engineering degrees with various tuition rates. The top affordable universities for civil engineering degrees offer a range of benefits, including low tuition rates, quality education, and opportunities for hands-on learning. At Lab Sciences Hall West, Minnesota State University-Mankato welcomes students with a cheap, 128-credit, ABET-accredited program that spans eight 15-week semesters.The University of California-Los Angeles (UCLA) offers a well-rounded civil engineering program that is both affordable and accredited. For students who want to specialize in different tracks such as structural, transportation, geotechnical, or environmental/water resources, UCLA provides four options. Bulldogs may also pursue additional opportunities like earning the Precast Concrete Certificate, participating in the Geowall Competition, joining the AISC Chapter, or becoming Goldwater Scholars.In contrast, Western Michigan University stands out for its high-value degree in civil engineering with a lower tuition rate of \$12,483 compared to UCLA's in-state tuition of \$13,366. The Broncos can benefit from an 18:1 student-faculty ratio and a graduation rate of 91 percent.Another option is Georgia Institute of Technology, which offers a low-cost B.S. in Civil Engineering with five tracks at a lower price point of \$12,424 in-state tuition. Led by Dr. Steven McLaughlin, the Yellow Jackets can take advantage of internships, research opportunities, and networking with top organizations like Parsons.Texas A&M University is also an affordable option for civil engineering students, with an in-state tuition of \$11,870. The Aggies can benefit from eight concentrations, including water resources and coastal engineering, as well as a 128-credit, ABET-accredited curriculum.Lastly, the University of Texas at Austin features its 34th best affordable Bachelor's in Civil Engineering degree for 2020 with an in-state cost of \$10,610. The Longhorns can take advantage of research opportunities, internships, and connections to 70,000 alumni across 24 majors. South Dakota School of Mines and Technology ranked 33rd for affordable civil engineering degrees, offering a B.S. in Civil Engineering with an optional Environmental Engineering Emphasis and Accelerated B.S/M.S. Track at \$10,610 in-state tuition.##ENDARTICLEThe University of Alabama at Birmingham (UAB) offers an inexpensive Civil Engineering degree program with in-state tuition of \$8,764 per year for a 4-6 year completion rate of 56 percent.At UAB's Hoehn Hall, the School of Engineering provides a cheap B.S. in Civil Engineering and an optional Fast-Track Masters M.S.C.E. Program to train technical undergrads for median \$84,770 pay. The program is headed by Dr. Fouad Fouad and is an ABET-accredited curriculum that offers a Sustainable Engineering Design Concentration after core courses like Statics and Problem Solving.UAB also has a partnership with Alexandria University, allowing students to study abroad, intern with Volkert, join the ITE Student Chapter, and win the Dupuis Scholarship.Kennesaw State University ranks 23rd among our best affordable Bachelors in Civil Engineering and Construction Engineering with a cheap \$6,356 in-state value and 20:1 student-faculty ratio. At Statesboro Building 232, the College of Engineering & Computing provides a low-cost B.S. in Civil Engineering that accepts \$55 applications until November 30th from students with a minimum 2950 eligibility index score. Headed by Dr. David Scott, this top 337-unit, ABET-accredited plan progresses through courses like Concrete Design and Soil Sciences. Wildcats can also land the Surveying-Geomatics Lab internship, research in the Ray Wright Builders Scholarship program, join Sigma Lambda Chi, and win the \$3,500 scholarship. San Diego State University and Kennesaw State University are both highly regarded institutions for affordable civil engineering degree programs. Both universities offer high-value, 21:1 student-faculty ratios and low tuition costs.Kennesaw State University is ranked the 17th best cheap civil engineering degree provider with an in-state yearly tuition of \$6,347. The Southern Polytechnic College of Engineering & Technology at Marietta Building L offers a top-value B.S. in Civil Engineering and B.S. in Construction Engineering with selective 58 percent acceptance.San Diego State University is ranked the 16th spot among our high-value civil engineering degree programs with a \$7,489 in-state cost and 74 percent graduation rate. The College of Engineering on Campanile Drive enrolls 4,103 learners in 18 majors, including a cost-effective B.S. in Civil Engineering and similar B.S. in Construction Engineering.California State Polytechnic University-Pomona is an affordable accredited university for civil engineering degrees. It starts the top 15 affordable colleges for civil engineering degree studies with an economical \$7,353 in-state tuition and 71 percent completion. The College of Engineering has America's largest B.S. in Civil Engineering with over 5,000 graduates of four tracks: General Civil, Geospatial, Construction, or Environmental.California State University-Sacramento is one the most cost-effective universities for civil engineering degree programs. It is deemed the AS Staffs 14th best affordable college for civil engineering degree options with a cheap \$7,310 in-state figure and 26:1 student-faculty ratio.San Francisco State University has our websites 13th most economical civil engineering degree with a \$7,260 in-state cost yearly and 55 percent completion rate. The School of Engineering has offered a best-value B.S. in Civil Engineering since 1959 for Bay Area young professionals to take the Fundamentals of Engineering licensure exam.California State University-Northridge is our rankings 12th most affordable college for civil engineering degree programs with an economical \$7,310 in-state tuition and 28:1 student-faculty ratio. The College of Engineering has a high-value BS in Civil Engineering with over 2,000 graduates of four tracks: General Civil, Geospatial, Construction, or Environmental.California State University-Fullerton tops list of affordable colleges for civil engineering degree paths with a cheap \$6,886 in-state rate and 25:1 student-faculty ratio. Since Fall 1985, the College of Engineering & Computer Science has developed a Civil Engineering B.S. with 20-year PayScale ROI of \$385,000 for infrastructure innovators.##ARTICLEparaphrased text hereThe University of Wyoming is ranked as the best affordable college for civil engineering degree programs with an in-state tuition of \$4,831 and out-of-state tuition of \$17,276. The student-faculty ratio is 21:1, and the graduation rate is 52 percent.##ARTICLEThe initial setting time of ordinary Portland cement is typically between 30 minutes to 10 hours. The final setting time can be as long as 10 hours. A standard bag of cement weighs around 50 kg. Parapet walls usually range from 900 mm to 1200 mm in height, depending on the building code and local regulations. For concrete workability, a slump test ranges between 75-100 mm. The unit weight of steel is approximately 7850 kg/m. A recommended curing period for concrete is at least 7 days for ordinary Portland cement and 14 days for blended cement. Bricks typically come in two standard sizes: 190 mm x 90 mm x 90 mm or 230 mm x 110 mm x 70 mm. Coarse aggregate usually has a size of 20 mm.deep foundations pile foundations caissons. 34-Types beams some common includes simply supported cantilever continuous fixed beams. 35-Types columns Some common columns tied spiral composite columns. 36-Plinth level The plinth level part building above ground below finished floor level. 37-Damp proof course (DPC) A DPC horizontal layer waterproof material applied wall foundation prevent moisture penetration. 38-Standard size septic tank Standard size depends number users but typically range 4500-6000 liters 1000-1300 gallons. 39-Types stairs Some common types straight L-shaped U-shaped spiral circular stairs. 40-Minimum width stair Minimum width residential buildings 900 mm feet commercial buildings 1200 mm feet. 41-Risers treads stairs Recommended height riser 150-200 mm inches tread 250-300 mm inches. 42-Risers treads stairs Recommended height riser 150-200 mm inches tread 250-300 mm inches. 43-Types roof trusses Some common types King Post Truss Queen Post Howe Pratt Fink Truss. 44-Standard brick masonry mortar mix Standard mix load-bearing walls partition walls. 45-Water-cement ratio Water-cement ratio weight water cement concrete mix Typical range 0.4 0.6. 46-Types formwork Common types timber plywood steel plastic formwork. 47-Standard size room Standard size bedroom residential building mm feet living room 3600 mm 4800 mm feet. 48-Types loads structures Dead live wind snow seismic loads. 49-Types retaining walls Gravity cantilever counterfort anchored walls. 50-Factor safety Factor safety ultimate load-carrying capacity structure actual applied load Used account uncertainties material properties construction quality design assumptions. 51-Spacing expansion joints concrete pavements Spacing depends concrete type environmental conditions typically ranges 4.5 m 30 feet. 52-Standard size steel reinforcement bar Standard sizes diameter mm feet. 53-Types trusses Common types king post queen Howe Pratt Warren truss. 54-Modulus elasticity steel Modulus elasticity steel Youngs modulus approximately GPa ksi. 55-Modulus elasticity concrete Modulus elasticity concrete depends compressive strength estimated formula Ec = 4700fc MPa. 56-Factor safety soil Factor safety varies application typically ranges 1.5 3. 57-Coefficient permeability Coefficient permeability measure ability transmit water expressed m/s. 58-Types soil tests Common soil tests Atterberg limits compaction consolidation permeability shear strength tests. 59-Types pile foundations Pile foundations classified driven bored piles precast concrete steel timber drilled cast-in-place piles shafts. 60-Standard length reinforcement bars Standard length meters feet. 61-Slump test Slump test measure workability fresh concrete performed slump cone. 62-Types beams Common types simply supported cantilever overhanging continuous beams. 63-Types columns Some common columns tied spiral composite columns. 64-Bearing capacity soil Bearing capacity soil maximum load unit area can support excessive settlement failure. 65-Slope stability analysis Slope stability evaluation stability slopes loading environmental conditions prevent landslides failures. 66-Types shallow foundations Shallow foundations include spread footingsHere are some key terms in construction engineering: footing types include isolated footings, combined footings, strip footings, raft or mat foundations, pile caps, strap footings. Deep foundation types include pile foundations, drilled shafts, and caissons. Bending moment (M) can be calculated as M = F d, where F is the force acting on the beam, and d is the distance from the point of interest to the forces point of application. Shear force (V) at a point along a beam can be calculated as V = F, where F is the sum of all vertical forces acting on the beam. Deflection of beams can be calculated using various methods such as double integration, Macaulay's method, or moment. Quality control in construction involves ensuring that materials and workmanship meet specified requirements through testing, inspection, and documentation. Pre-stressed concrete is a type of concrete in which internal stresses are induced to counteract the tensile stresses that occur due to external loads. Types of pre-stressing include pre-tensioning and post-tensioning. Moment of inertia (I) is a measure of an objects resistance to bending and can be calculated for different cross-sectional shapes using standard formulas. Section modulus (Z) is a measure of the strength of a structural member in bending and can be calculated as Z = I/y, where I is the moment of inertia, and y is the distance from the neutral axis to the outermost fiber. Steel connections can be classified into bolted connections, welded connections, and riveted connections. Bridges types include beam bridges, arch bridges, truss bridges, suspension bridges, cable-stayed bridges, road pavement layers including subgrade, subbase, base course, wearing course. Concrete mixers can be classified into tilting drum mixers, non-tilting drum mixers, pan mixers. Earthwork calculations involve determining the volume of cut and fill required for grading a site using methods such as average end area method or prismoidal formula. Surveying instruments include theodolites, total stations, levels, GPS equipment. Footings can be classified into isolated footings, combined footings, strip footings, raft or mat foundations, pile caps. Some common tests for fresh concrete are slump test, flow table test, compaction factor test. Hardened concrete tests include compressive strength test, split tensile strength test, flexural strength test. Dams types include gravity dams, arch dams, buttress dams, embankment dams. Joints in concrete can be classified into construction joints, expansion joints, and contraction joints. Curing methods for concrete include water curing, membrane curing, steam curing, electrical curing. Admixtures are added to concrete to modify its properties such as workability, strength, durability, setting time. Steel sections types include I-beams, H-beams, channels, angles, plates. Soil classification systems include Unified Soil Classification System (USCS) and AASHTO Soil Classification System. Retaining walls types include gravity walls, cantilever walls, sheet pile walls, mechanically stabilized earth (MSE) walls. Excavation supports include sheet piles, soldier piles and lagging, braced cuts, slurry walls. Formwork materials used are timber, plywood, steel, aluminum, plastic. Loads on structures include dead loads, live loads, wind loads, earthquake loads, temperature effects. Bearing capacity factors (Nc, Nq, and N) are used to determine the ultimate bearing capacity of soil using Terzaghis bearing capacity equation. Geosynthetics types include geotextiles, geogrids, geomembranes, geonets. The water-cement ratio is the ratio of the weight of water to the weight of cement in a concrete mix which significantly influences the strength and workability of the concrete. Load combinations are specific sets of loads a structure must withstand as specified in relevant design codes and standards. Wind load calculation can be done using gust response factor, static or dynamic methods depending on buildings height, shape and location. Seismic design involves designing structures to resist the forces generated by earthquakes.paraphrased text here##ENDARTICLELooking forward to seeing everyone at the meeting tomorrow to discuss our strategies in the field of government and public services, including nonresidential building construction, pipeline transportation of natural gas, oil and gas extraction, and petroleum and coal products manufacturing.many civil engineers work for industries such as construction managers, who may not necessarily have a degree in civil engineering, but rather years of experience in the construction business. However, obtaining a bachelor's degree in civil engineering from an ABET-accredited program is one way to break into this field.to become a successful civil engineer, one must be prepared to spend time in laboratories and conducting fieldwork, as well as completing traditional classroom learning. This includes taking college preparatory courses in science and mathematics, earning a bachelor's degree in civil engineering, developing real-world skills through internships and co-op experiences, and preparing for licensure by taking the Fundamentals of Engineering exam.although not every civil engineer needs a license to perform their work, having one can open up more job opportunities. The path to becoming a civil engineer is relatively straightforward, but it does require a strong foundation in math and basic science, as well as being willing to put in the hard work necessary to succeed.civil engineering degrees are available at various levels of study, including undergraduate, graduate, and doctoral degrees. A bachelor's degree is generally considered the minimum level of education needed to enter the field, but some industry experts believe that a master's degree may be preferred by many employers.for those who cannot afford to pursue a four-year university program, an associate's degree in civil engineering can provide a solid foundation for related roles such as engineering surveyor or design technician. However, it is essential to note that associate's degrees in civil engineering and technology are different, and only the latter may fully prepare students for engineering technician roles.in summary, becoming a successful civil engineer requires hard work, dedication, and a strong understanding of math and basic science. With the right education and experience, individuals can break into this rewarding field and pursue a career that is both challenging and fulfilling.Aspiring engineers typically spend four years earning their bachelor's degrees, especially when pursuing challenging fields like science, math, and engineering. Many programs offer co-op experiences that provide substantial hands-on work experience, potentially increasing the completion time to six months or a year, but granting valuable industry exposure.Following graduation, some students may opt for advanced graduate degrees in civil engineering. These typically require more extensive education beyond the bachelor's level, particularly for specialized areas of civil engineering. Master's programs accredited by ABET (Accreditation Board for Engineering and Technology) include at least 30 credits of coursework, although some programs demand more. Completion times vary, but a typical master's degree takes two years.Students can choose from thesis or non-thesis options in their graduate studies. Doctoral degrees, such as PhDs or Doctor of Engineering (DEng or EngD), are often pursued for academic or senior positions in engineering practice and industry. A PhD focuses on research, while a DEng has more practical applications.For civil engineers, developing technical knowledge and non-technical skillsets is crucial. This includes coursework in general education areas, basic science and math courses, core engineering courses, and specialized major coursework. These courses help broaden students' knowledge, enhance critical thinking and problem-solving skills, and prepare them for the complexities of infrastructure projects.Core general education requirements often include writing, public speaking, literature, history, art, psychology, laboratory science, and mathematics. Laboratory sciences and calculus are particularly essential for engineering students. Students in civil engineering typically take advanced courses in physics, chemistry, geology, and environmental chemistry.Regardless of their specialization, engineering students must develop an understanding of the fundamentals of engineering through coursework such as Introduction to Engineering and engineering graphics. 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