

ACCE 2-Year Program Student Learning Outcomes

1. Demonstrate effective communication, both orally and in writing.
2. Demonstrate the ability to estimate quantities and costs for the bidding process in a construction project.
3. Demonstrate the ability to schedule a basic construction project.
4. Demonstrate the ability to use current technology related to the construction process.
5. Interpret construction documents (contracts, specifications, and drawings) used in managing a construction project.
6. Apply basic principles of construction accounting.
7. Use basic surveying techniques used in building layout.
8. Discuss basic principles of ethics in the construction industry.
9. Identify the fundamentals of contracts, codes, and regulations that govern a construction project.
10. Recognize basic construction methods, materials and equipment.
11. Recognize basic safety hazards on a construction site and standard prevention measures.
12. Recognize the basic principles of structural design.
13. Recognize the basic principles of mechanical, electrical and plumbing systems.

ACCE 4-year Program Student Learning Outcomes

1. Create oral presentations appropriate to the construction discipline.
2. Create written communications appropriate to the construction discipline.
3. Apply construction management skills as an effective member of a multi-disciplinary team.
4. Analyze professional decisions based on ethical principles.
5. Analyze methods, materials, and equipment used to construct projects.
6. Understand the purposes of individuals, companies and agencies involved in the construction process.
7. Analyze construction documents for planning and management of construction processes.
8. Understand the basic principles of structural behavior.
9. Understand the basic principles of mechanical, electrical and plumbing systems.
10. Understand the basic principles of sustainable construction.
11. Apply basic surveying techniques for construction layout and control.
12. Create construction project cost estimates.
13. Create construction project schedules.
14. Understand construction accounting and cost control.
15. Understand construction risk management.
16. Understand the legal implications of contract, common, and regulatory law to manage a construction project.
17. Create a construction project safety plan.
18. Understand construction project control processes.
19. Understand construction quality assurance and control.
20. Apply appropriate state-of-the-art electronic-based technology to manage the construction process

Program Learning Outcomes

A - Demonstrate knowledge and skills in basic construction business management and organization.

B - Demonstrate a firm understanding of how to read and interpret commercial drawings and specifications.

C - Develop a systematic approach to construction cost estimating and project management techniques.

D - Illustrate proficiency in the use of computers and construction related software for estimating, project management, and basic office communication.

E - Apply relevant communication skills, project teamwork, and problem solving techniques in the construction industry work environment.

DACUM Research Chart for Sustainable Building Technologist (Green Collar Scholars)

Produced for:



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TASKS

A. Perform Pre-Construction Phase Activities	A.1 Research building project constraints	A.2 Research AHJ and applicable codes	A.3 Coordinate LEED related activities	A.4 Document existing project site conditions	A.5 Evaluate site designs	A.6 Assist with building energy and daylight models	A.7 Perform water use and collection calculations	A.8 Research green certifications	A.9 Research sustainability grants, tax credits and rebates
	A.10 Distribute project team contact and correspondence list	A.11 Participate in project team meetings	A.12 Prepare project team meeting minutes	A.13 Integrate green solutions recommendations into design and BIM documentation	A.14 Perform BIM coordination	A.15 Assist with selection of green materials and systems	A.16 Prepare green materials list	A.17 Edit project specifications	A.18 Prepare waste management construction plan
	A.19 Prepare Air Quality Construction Plan	A.20 Assist with SWPPP coordination							
B. Perform Construction Phase Activities	B.1 Perform submittal review (products, equipment, systems)	B.2 Assist with permit process	B.3 Distribute commissioning plan and checklist	B.4 Verify received materials	B.5 Track green materials	B.6 Assist with coordination of green trades	B.7 Manage construction waste plan	B.8 Assist with construction checklist verification	B.9 Manage IAQ plan
	B.10 Assist with compliance documentation	B.11 Assist with systems performance testing (e.g., HVAC, plumbing, lighting)	B.12 Assist with envelope performance testing (e.g., windows, air barrier)	B.13 Collect SWPPP event reports	B.14 Input facility management systems-related data	B.15 Perform flushout calculations			
C. Perform Post-Construction Phase Activities	C.1 Document air quality flushout plan	C.2 Update energy management plan	C.3 Help coordinate submittal data for O & M manuals	C.4 Compile construction phase report for commissioning agent (e.g., substantial completion, record drawings, T & B report)	C.5 Upload documents to LEED online	C.6 Update standards with lessons learned (e.g., company owner)	C.7 Implement green signage	C.8 Establish O & M points of contact	C.9 Document building performance goals
D. Perform O & M Related Activities	D.1 Maintain O & M and project team points of contact	D.2 Train O & M staff in green practices (e.g., soap, cleaning supplies)	D.3 Track utility performance (e.g., gas, water, electrical)	D.4 Report actual building occupancy	D.5 Set up data loggers	D.6 Validate EMS set points	D.7 Educate occupants on building sustainability plan	D.8 Oversee building recycling plan	D.9 Verify use of green consumables
	D.10 Conduct building sustainability performance review	D.11 Maintain list of building performance related issues	D.12 Maintain LEED compliance documents	D.13 Assist with third party audits					

DACUM Research Chart for Sustainable Building Technologist

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DUTIES TASKS

E. Participate in Professional Development Activities	E.1 Develop personal professional development plan	E.2 Complete professional certifications (e.g., LEED GA, BOC, CDT)	E.3 Participate in continuing education activities	E.4 Facilitate continuing education activities	E.5 Participate in code update training	E.6 Participate in BIM related software training	E.7 Compile list of company best practices	E.8 Participate in professional organizations	E.9 Participate in mentoring activities
	E.10 Participate in conferences and trade shows	E.11 Facilitate community outreach activities	E.12 Assist with smart technology feasibility studies						
F. Perform Administrative Tasks	F.1 Maintain green product library	F.2 Assist with development of materials to market green practices	F.3 Identify green marketing opportunities	F.4 Maintain standard green specifications	F.5 Participate in staff meetings	F.6 Establish personal performance deliverables	F.7 Document time and daily activities		

Tools, Equipment, Supplies and Materials

Airflow hood
Azimuth tool
Augmented reality tools (e.g., Dagri)
Blower door
Cell phone
CO₂ sensor
Data loggers
Duct blaster
Infrared scanner
Laser level
Light meter
Measuring tools (e.g., tape measure)
Solimetric sun eye
sUAS
Tablet-based applications
Temperature sensor

Acronyms

AHJ Authority Having Jurisdiction
BIM Building Information Model
BOC Building Operating Certificate
CDT Construction Document Technologist
EMS Energy Management System
FF&E Furniture, Fixtures and Equipment
HERS Home Energy Rating System
IAQ Indoor Air Quality
LEED Leadership in Energy and Environmental Design
LEED GA LEED Green Associate
O & M Operations and Maintenance
PV Photovoltaic
sUAS Small Unmanned Aircraft System
SWPPP Stormwater Pollution Prevention Plan
T & B Test and Balance
VOC Volatile Organic Compound

Behaviors

Detail oriented
Collaborative
Analytical
Punctual
Observant
Self-motivated
Perseverance
Confident
Respectful
Professional attire
Initiative
Passion for sustainability

General Knowledge and Skills

Computer Skills:
• Spreadsheets
• Apps
• Internet research
• Microsoft Office type tools
• Data (obtain, organize)
• Multi-device and media aptitude
Electronic communication protocol (e.g., email vs. texts)
Knowledge of design and construction industry
General knowledge of construction trades
Technical writing
Basic understanding of building science
Ability to read construction documents
LEED GA Certification
OSHA for Construction certification
Energy basics
Construction specification formats
Familiarity with green and energy codes and standards
BOC
Time management skills
Presentation skills
Functional aspects of landscaping and plant choice
Sustainability theory and philosophy

Future Trends and Concerns

Resistance to green materials and systems
Financing mechanisms not set up to accommodate long range thinking
Tax Credits availability
Economic growth and stability
Lack of skilled labor
Diminishing vocational education opportunities in high school
Resource depletion
Climate change
Increasing energy costs
Increasing water costs
Adoption of future Technology
Initial cost of green energy systems
Automated data analysis
Cyber security
Failure to integrate sustainability into design
Changing code requirements
Need lobbying for green/renewable energy
Pre-fabricated/modular construction techniques
Additive manufacturing
Integration of augmented reality with construction practices
Smart technology to collect data on resource consumption

Recommendations:

- Offer construction technology course in high school
- Community outreach and education on the cost to benefit of green adoption (high school teachers should be educated).
- Lobby for green/renewable energy
- Press releases/social media on progress of certificate and project development
- Proof studies on the benefits of green construction
- Before and after cost comparison
- Life cycle
- Publicize green efforts to create a buzz
- Leverage Campus as a Living Lab
- Collaborate/partner with local employers to train students (volunteers, as part of course/program)
- Mandatory participation in USGBC student group
- Encourage students to join student level of professional groups
- Collaborate with UNM programs
- Take field trips
- Conduct audits on their own buildings (homes, apartments, etc.)
- Students create learning modules and learning materials
- Identify green related projects that were started in schools and complete them, e.g., project where each public school's roof is assessed for how much solar power it could generate. Create a map that would show how many housing units/buildings in the immediate vicinity of the school could be powered with the solar generated energy.