In 2009, Louisiana and Mississippi partnered to research economic development opportunities and workforce needs associated with the region’s green economy. Through a $2.3 million grant from the U.S. Department of Labor, a consortium of the Louisiana Workforce Commission, Louisiana State University, Mississippi Department of Employment Security, and Mississippi State University conducted an extensive study of economic activity that is beneficial to the environment. This and other research products were developed as part of that effort.
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Introduction

As part of a comprehensive study of Louisiana’s green economy, career pathways were developed to provide career guidance to students and job seekers interested in coastal restoration work. Each career pathway identifies the specific occupations within an occupational group that are involved in restoration activities.

Each career pathway is organized by the level of education most commonly required for an occupation. This allows students to explore career opportunities available for different levels of educational attainment. Useful information such as sample job titles, occupation descriptions and wage data are included for each occupation. In addition, post-secondary educational programs that can lead to a career in coastal restoration work are provided.

Information used to develop the following career pathway was gathered through a series of in-person interviews, telephone interviews and focus groups with employers conducting restoration work. Additional information was sourced from the Employment and Training Administration’s Occupational Information Network. Finally, Louisiana Board of Regent’s data was used to identify degree and certificate programs that would best prepare students for careers in coastal restoration.
Coastal Restoration Engineering Occupations

Click on an occupation for more information.

- **Master's Degree**
  - Engineering Manager

- **Bachelor's Degree**
  - Environmental Engineer
  - Civil Engineer
  - Surveyor

- **Associate Degree or Vocational Training**
  - Environmental Engineering Technician
  - Civil Engineering Technician
  - Surveying Technician

- **High School Diploma / GED**
  - Civil Drafter
Engineering Managers

Possible Job Titles
Engineering Manager, Project Engineer, Project Engineering Manager, Project Manager, Director of Engineering, Chief Engineer, Civil Engineering Manager, Principal Engineer, Process Engineering Manager, Supervisory Civil Engineer

Job description
Plan, direct, or coordinate activities in such fields as architecture and engineering or research and development in these fields.

Tasks:
1. Coordinate and direct projects, making detailed plans to accomplish goals and directing the integration of technical activities.
2. Consult or negotiate with clients to prepare project specifications.
3. Present and explain proposals, reports, and findings to clients.
4. Direct, review, and approve product design and changes.
5. Recruit employees, assign, direct, and evaluate their work, and oversee the development and maintenance of staff competence.
6. Perform administrative functions such as reviewing and writing reports, approving expenditures, enforcing rules, and making decisions about the purchase of materials or services.
7. Prepare budgets, bids, and contracts, and direct the negotiation of research contracts.
8. Analyze technology, resource needs, and market demand, to plan and assess the feasibility of projects.
9. Confer with management, production, and marketing staff to discuss project specifications and procedures.
10. Review and recommend or approve contracts and cost estimates.

Education, Experience and Training
Job Zone Five: Extensive Preparation Needed

Median Annual Wage
$118,500

Training Opportunities

<table>
<thead>
<tr>
<th>Institution</th>
<th>Program</th>
<th>Degree / Certificate</th>
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</thead>
<tbody>
<tr>
<td>Louisiana State University</td>
<td>Civil Engineering</td>
<td>Master's Degree</td>
</tr>
</tbody>
</table>

> Return to Career Pathway Graphic
Environmental Engineers

Possible Job Titles
Environmental Engineer, Sanitary Engineer, Environmental Analyst, Hazardous Substances Engineer, Regulatory Environmental Compliance Manager, Environmental Remediation Specialist, Air Pollution Control Engineer, Marine Engineer CPVEC (Marine Engineer Commercial Passenger Vessel Environmental Compliance)

Job description
Design, plan, or perform engineering duties in the prevention, control, and remediation of environmental health hazards utilizing various engineering disciplines. Work may include waste treatment, site remediation, or pollution control technology.

Tasks:
1. Collaborate with environmental scientists, planners, hazardous waste technicians, engineers, and other specialists, and experts in law and business to address environmental problems.
2. Inspect industrial and municipal facilities and programs to evaluate operational effectiveness and ensure compliance with environmental regulations.
3. Prepare, review, and update environmental investigation and recommendation reports.
4. Design and supervise the development of systems processes or equipment for control, management, or remediation of water, air, or soil quality.
5. Provide environmental engineering assistance in network analysis, regulatory analysis, and planning or reviewing database development.
6. Obtain, update, and maintain plans, permits, and standard operating procedures.
7. Provide technical-level support for environmental remediation and litigation projects, including remediation system design and determination of regulatory applicability.
8. Monitor progress of environmental improvement programs.
9. Advise corporations and government agencies of procedures to follow in cleaning up contaminated sites to protect people and the environment.
10. Inform company employees and other interested parties of environmental issues.

Education, Experience and Training
Job Zone Four: Considerable Preparation Needed

Median Annual Wage
$ 75,480

Certificates or Licenses
All states require licensure of Engineers; The Louisiana Professional Engineering and Land Surveying Board issues licenses.

Training Opportunities

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<thead>
<tr>
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<tbody>
<tr>
<td>Louisiana State University</td>
<td>Environmental Engineering</td>
<td>Bachelor’s Degree</td>
</tr>
</tbody>
</table>

> Return to Career Pathway Graphic
Civil Engineers

Possible Job Titles ¹
Civil Engineer, Engineer, Project Engineer, Project Manager, Structural Engineer, City Engineer, Civil Engineering Manager, Design Engineer, Railroad Design Consultant, Hydraulic Engineer

Job description ¹
Perform engineering duties in planning, designing, and overseeing construction and maintenance of building structures, and facilities, such as roads, railroads, airports, bridges, harbors, channels, dams, irrigation projects, pipelines, power plants, water and sewage systems, and waste disposal units. Includes architectural, structural, traffic, ocean, and geo-technical engineers.

Tasks:
1. Manage and direct staff members and the construction, operations, or maintenance activities at project site.
2. Provide technical advice regarding design, construction, or program modifications and structural repairs to industrial and managerial personnel.
3. Inspect project sites to monitor progress and ensure conformance to design specifications and safety or sanitation standards.
4. Estimate quantities and cost of materials, equipment, or labor to determine project feasibility.
5. Test soils and materials to determine the adequacy and strength of foundations, concrete, asphalt, or steel.
6. Compute load and grade requirements, water flow rates, and material stress factors to determine design specifications.
7. Plan and design transportation or hydraulic systems and structures, following construction and government standards, using design software and drawing tools.
8. Analyze survey reports, maps, drawings, blueprints, aerial photography, and other topographical or geologic data to plan projects.
9. Prepare or present public reports on topics such as bid proposals, deeds, environmental impact statements, or property and right-of-way descriptions.
10. Direct or participate in surveying to lay out installations and establish reference points, grades, and elevations to guide construction.

Education, Experience and Training ¹
Job Zone Four: Considerable Preparation Needed

Median Annual Wage ⁴
$ 87,980

Training Opportunities ²,³

<table>
<thead>
<tr>
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<td>Bachelor’s Degree</td>
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<tr>
<td>Louisiana Tech University</td>
<td>Civil Engineering</td>
<td>Bachelor’s Degree</td>
</tr>
<tr>
<td>Southern University</td>
<td>Civil Engineering</td>
<td>Bachelor’s Degree</td>
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<tr>
<td>University of Louisiana at Lafayette</td>
<td>Civil Engineering</td>
<td>Bachelor’s Degree</td>
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<tr>
<td>University of New Orleans</td>
<td>Civil Engineering</td>
<td>Bachelor’s Degree</td>
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Surveyors

Possible Job Titles

County Surveyor, Surveyor, Land Surveyor, Survey Party Chief, Engineer, Engineering Technician, Geodesist, Licensed Land Surveyor, Mine Surveyor, Professional Land Surveyor

Job description

Make exact measurements and determine property boundaries. Provide data relevant to the shape, contour, gravitation, location, elevation, or dimension of land or land features on or near the earth's surface for engineering, mapmaking, mining, land evaluation, construction, and other purposes.

Tasks:

1. Verify the accuracy of survey data including measurements and calculations conducted at survey sites.
2. Search legal records, survey records, and land titles to obtain information about property boundaries in areas to be surveyed.
3. Calculate heights, depths, relative positions, property lines, and other characteristics of terrain.
4. Prepare and maintain sketches, maps, reports, and legal descriptions of surveys to describe, certify, and assume liability for work performed.
5. Direct or conduct surveys to establish legal boundaries for properties, based on legal deeds and titles.
6. Prepare or supervise preparation of all data, charts, plots, maps, records, and documents related to surveys.
7. Write descriptions of property boundary surveys for use in deeds, leases, or other legal documents.
8. Compute geodetic measurements and interpret survey data to determine positions, shapes, and elevations of geomorphic and topographic features.
9. Determine longitudes and latitudes of important features and boundaries in survey areas using theodolites, transits, levels, and satellite-based global positioning systems (GPS).
10. Record the results of surveys including the shape, contour, location, elevation, and dimensions of land or land features.

Education, Experience and Training

Job Zone Four: Considerable Preparation Needed

Median Annual Wage

$50,040

Certificates or Licenses

All states require licensure of Engineers; The Louisiana Professional Engineering and Land Surveying Board issues licenses.

Training Opportunities

<table>
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<th>Institution</th>
<th>Program</th>
<th>Degree / Certificate</th>
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<tbody>
<tr>
<td>Nicholls State University</td>
<td>Geomatics</td>
<td>Bachelor’s Degree</td>
</tr>
</tbody>
</table>

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## Environmental Engineering Technicians

### Possible Job Titles

- Environmental Technician
- Environmental Specialist
- Environmental Engineering Technician
- Industrial Waste Inspector
- Engineer Technician
- Environmental Engineering Assistant
- Environmental Field Technician

### Job description

Apply theory and principles of environmental engineering to modify, test, and operate equipment and devices used in the prevention, control, and remediation of environmental pollution, including waste treatment and site remediation. May assist in the development of environmental pollution remediation devices under direction of engineer.

Tasks:

1. Receive, set up, test, and decontaminate equipment.
2. Maintain project logbook records and computer program files.
3. Conduct pollution surveys, collecting and analyzing samples such as air and ground water.
4. Perform environmental quality work in field and office settings.
5. Review technical documents to ensure completeness and conformance to requirements.
6. Perform laboratory work such as logging numerical and visual observations, preparing and packaging samples, recording test results, and performing photo documentation.
7. Review work plans to schedule activities.
8. Obtain product information, identify vendors and suppliers, and order materials and equipment to maintain inventory.
9. Arrange for the disposal of lead, asbestos and other hazardous materials.
10. Inspect facilities to monitor compliance with regulations governing substances such as asbestos, lead, and wastewater.

### Education, Experience and Training

Job Zone Three: Medium Preparation Needed

### Median Annual Wage

$ 38,560
Civil Engineering Technicians

Possible Job Titles
Engineering Technician, Civil Engineering Technician, Civil Engineering Designer, Engineering Assistant, Transportation Engineering Technician, Civil Designer, Engineering Specialist, Civil Engineering Assistant, Construction Analyst, Design Technician

Job description
Apply theory and principles of civil engineering in planning, designing, and overseeing construction and maintenance of structures and facilities under the direction of engineering staff or physical scientists.

Tasks:
1. Draft detailed dimensional drawings and design layouts for projects and to ensure conformance to specifications.
2. Calculate dimensions, square footage, profile and component specifications, and material quantities using calculator or computer.
3. Read and review project blueprints and structural specifications to determine dimensions of structure or system and material requirements.
4. Confer with supervisor to determine project details such as plan preparation, acceptance testing, and evaluation of field conditions.
5. Inspect project site and evaluate contractor work to detect design malfunctions and ensure conformance to design specifications and applicable codes.
6. Develop plans and estimate costs for installation of systems, utilization of facilities, or construction of structures.
7. Prepare reports and document project activities and data.
8. Respond to public suggestions and complaints.
9. Report maintenance problems occurring at project site to supervisor and negotiate changes to resolve system conflicts.
10. Evaluate facility to determine suitability for occupancy and square footage availability.

Education, Experience and Training
Job Zone Three: Medium Preparation Needed

Median Annual Wage
$43,870

Training Opportunities

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<tr>
<th>Institution</th>
<th>Program</th>
<th>Degree / Certificate</th>
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</thead>
<tbody>
<tr>
<td>Delgado Community College</td>
<td>Applied Civil &amp; Construction Engineering Technology</td>
<td>Associate’s Degree</td>
</tr>
</tbody>
</table>

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Surveying Technicians

Possible Job Titles

Job description
Adjust and operate surveying instruments, such as the theodolite and electronic distance-measuring equipment, and compile notes, make sketches and enter data into computers.

Tasks:

1. Adjust and operate surveying instruments such as prisms, theodolites, and electronic distance-measuring equipment.
2. Perform calculations to determine earth curvature corrections, atmospheric impacts on measurements, traverse closures and adjustments, azimuths, level runs, and placement of markers.
3. Record survey measurements and descriptive data using notes, drawings, sketches, and inked tracings.
4. Search for section corners, property iron, and survey points.
5. Position and hold the vertical rods, or targets, that theodolite operators use for sighting to measure angles, distances, and elevations.
6. Lay out grids, and determine horizontal and vertical controls.
7. Compare survey computations with applicable standards to determine adequacy of data.
8. Set out and recover stakes, marks, and other monumentation.
9. Direct and supervise work of subordinate members of surveying parties.
10. Conduct surveys to ascertain the locations of natural features and man-made structures on the Earth's surface, underground, and underwater using electronic distance-measuring equipment and other surveying instruments.

Education, Experience and Training
Job Zone Three: Medium Preparation Needed

Median Annual Wage
$31,760

Training Opportunities

<table>
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<tr>
<th>Institution</th>
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<th>Degree / Certificate</th>
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</thead>
<tbody>
<tr>
<td>Louisiana Technical College</td>
<td>Civil, Surveying &amp; Mapping Technology</td>
<td>Associate’s Degree</td>
</tr>
</tbody>
</table>

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Civil Drafters

Possible Job Titles
Computer-Aided Design Technician (CAD Technician), Civil Drafter, Computer-Aided Design Designer (CAD Designer), Computer-Aided Design Operator (CAD Operator), Computer-Aided Drafting and Design Drafter (CADD Drafter), Drafting Technician, Draftsman, Draftsperson, Civil CAD Designer (Civil Computer Aided Design Designer), Civil CAD Tech (Civil Computer-Aided Design Technician)

Job description
Prepare drawings and topographical and relief maps used in civil engineering projects, such as highways, bridges, pipelines, flood control projects, and water and sewerage control systems.

Tasks:
1. Produce drawings using computer-assisted drafting systems (CAD) or drafting machines, or by hand using compasses, dividers, protractors, triangles and other drafting devices.
2. Draw maps, diagrams, and profiles, using cross-sections and surveys, to represent elevations, topographical contours, subsurface formations and structures.
3. Draft plans and detailed drawings for structures, installations, and construction projects such as highways, sewage disposal systems, and dikes, working from sketches or notes.
4. Determine the order of work and method of presentation, such as orthographic or isometric drawing.
5. Finish and duplicate drawings and documentation packages, according to required mediums and specifications for reproduction using blueprinting, photography, or other duplicating methods.
6. Review rough sketches, drawings, specifications, and other engineering data received from civil engineers to ensure that they conform to design concepts.
7. Calculate excavation tonnage and prepare graphs and fill-hauling diagrams for use in earth-moving operations.
8. Supervise and train other technologists, technicians and drafters.
9. Correlate, interpret, and modify data obtained from topographical surveys, well logs, and geophysical prospecting reports.
10. Determine quality, cost, strength and quantity of required materials, and enter figures on materials lists.

Education, Experience and Training
Job Zone Three: Medium Preparation Needed

Median Annual Wage
$ 45,760

Training Opportunities

<table>
<thead>
<tr>
<th>Institution</th>
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<th>Degree / Certificate</th>
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</thead>
<tbody>
<tr>
<td>Delgado Community College</td>
<td>Computer Aided Design and Drafting</td>
<td>1 Year Certificate</td>
</tr>
<tr>
<td>Louisiana Technical College</td>
<td>Drafting/Design Technology: Engineering Aide II</td>
<td>1 Year Certificate</td>
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</tbody>
</table>

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Notes


