



Energy Professional

Training Program Catalog

Power52 Energy Institute

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2020

FROM THE PRESIDENT...

“Education is the passport to the future, for tomorrow belongs to those who prepare for it today.” – Malcolm X

The decision to return to school is never an easy one, especially if you've been out of the classroom for a while, or in some cases have never even been inside a classroom at all. Everyone's situation is unique, and regardless of your reason, going back to school requires a personal commitment of time, talents and resources. In addition, it requires the support and commitment of those around you.

That is why the POWER52 Team is committed in assisting individuals like you! We strive to make sure your educational achievements and career goals in the energy sector are accomplished. Whether you are graduating from high school, a college graduate, a returning citizen, or a recovering substance abuse user; POWER52 is here to provide the training, life skills development, and professional support to help you reach your highest potential.

If you are reading this, you have just taken the most important step in changing the rest of your life! On behalf of myself and the entire POWER52 family, we welcome you to the Energy Professional Training Program and wish you much success.

This handbook was developed to outline the expectations of our trainees, and the policies & procedures of the program. Trainees should familiarize themselves with the handbook. The handbook holds the answers to many of your questions in regards to the POWER52 training program.

We hope that your experience here will be challenging, enjoyable, and rewarding.

Warm regards,



Cherie Brooks
President/CEO
POWER52 Foundation

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ORGANIZATIONAL OVERVIEW/MISSION

Vision

To strengthen communities and inspire people to achieve their potential through hands-on job- training in the energy sector.

Mission

POWER52's mission is to break the cycles of poverty, unemployment, underemployment and incarceration in our Urban Communities across the nation while simultaneously advancing community resilience through a sustainable strategy.

Goals

The program has three major goals:

- Increase a community's interest and knowledge about working in the renewable energy sector, its role in a green community and what benefits a resiliency hub will offer them.
- Empower the community through training and job creation.
- Advance low-income community resilience, offering disaster relief support.

Power52, Inc. d/b/a POWER52 Foundation (hereafter referred to as "Power52") is a 501(c)(3) not for profit which is governed by a Board of Directors. Power52 Energy Institute Howard County is owned and operated by Power52. The Executive Director is the Chief Executive Officer of the Corporation and has general charge and control of all its business affairs and properties.

Board of Directors

Walter Barnes, III, President, PM Consulting Group, POWER52 Foundation Board of Directors Chairman

Cherie Brooks, President/CEO & Co-Founder, POWER52 Foundation

Marty Lampner, RETIRED, Chimes Family of Services

Joe Durham, Market Executive, The Columbia Bank

Theodore Offit, General Counsel, Offit Kurman Attorneys at Law

Antawan Anderson, Anderson & Company LLC

Robert Daniel Wallace, Co-Founder, POWER52 Foundation (Advisory)

Ray Lewis, Co-Founder, POWER52 Foundation (Advisory)

Henry Cortes, Owner, EPC, Core Development Group

Mike Volpe, Vice President, Open Road Renewables

Barbara Ebel, Labor Exchange Administrator, MD Department of Labor

Walter Simmons, President & CEO, Employ Prince George's, Inc.

BRIEF HISTORY

POWER52 was Co-Founded by Cherie Brooks, Ray Lewis, and Rob Wallace, the POWER52 Foundation's mission is to help strengthen communities and inspire people to achieve their potential through hands-on job training in the energy sector. POWER52 in partnership with Living Classrooms launched their Energy Professional Training program in October 2016 bringing workforce development, resiliency, and clean energy solutions to low and medium income communities. In addition, POWER52 is working with Living Classrooms to convert their community centers into resiliency hubs, offering disaster relief support to their neighboring communities. POWER52 became an Accredited Training Sponsor in 2017 and has been providing NCCER training since that time. Power52 is forecasted to open their second school in Howard County, Maryland February of 2018.

POWER52 sought NCCER accreditation based on its desire for a portable, nationally recognized and standardized training process. This process is available without discrimination due to race, color, religion, national origin, gender, age, veteran status, physical or mental disability, sexual orientation, or any other reason prohibited by local, state or federal regulations.

PROGRAM OBJECTIVES

POWER52's Energy Professional Training program is accredited by The National Center for Construction on Education & Research (NCCER). The standardized curriculum covers the basic concepts of Solar Photovoltaic (PV) systems and their components. It also explains how PV systems are sized, designed, and installed. POWER52 Energy Solutions will be instrumental in overseeing that our training curriculum is aligned to meet workforce needs and the needs of our employment partners, as well as facilitating the transition from training to employment by overseeing four (4) weeks of paid supervised on-the-job training during which trainees safely and accurately install solar panels and battery storage on facilities with diverse roof styles as well as offsite ground mount systems.

Ultimately the customized training program will, at a minimum, instruct trainees to do the following:

- identify photovoltaic (PV) applications and advantages
- identify system components and their functions
- identify safety hazards associated with PV installations
- trace a basic electrical circuit and perform calculations using Ohm's law
- list PV system sizing considerations
- identify PV electrical and mechanical system design considerations
- describe the tasks required to complete a site analysis
- identify the effects of the environment on panel output
- describe how to install a simple grid-connected PV system
- explain how to assess system operation and efficiency
- recognize the tasks required when performing PV maintenance and troubleshooting
- identify appropriate codes and standards concerning installation, operation, and maintenance of PV systems and equipment

Power52 will provide wrap around services for our training program which includes extensive case management throughout the program and for twelve (12) months beyond, we ensure that participants of the program receive the support they need to be successful. In addition, the training curriculum includes "soft skills" training that teaches the importance of punctuality, work habits, professional appearance, time management, etc. Ultimately, the training program yields a marketable skill in an industry that has significant need for skilled workers and pays a living wage.

The job readiness portion of the curriculum focuses on resume building, interviewing conduct, professional attire, social media networking and account creation, financial literacy, and life skills. Trainees successfully completing the required instructional/lab clock hours of the program and passing all module exams will sit for the North American Board of Certified Energy Practitioners (NABCEP) Entry Level Associates Exam administered by POWER52. Once all requirements have been met, trainees will receive NCCER Credentials, POWER52 Certificate, and entry on the NABCEP Associate Credential Directory. These credentials will qualify the training candidate to apply for employment as a PV System Installer as well as an Entry Level Construction Worker.

PROGRAM GOALS

The primary goals of the training program at POWER52 are as follows:

- Provide a standardized training method that will verify and document a trainee's mastered skills
- Have a tangible method by which to ensure the qualifications of trainees
- Match job assignments with proven performance capabilities in a manner that will foster a sense of ownership, contribution and pride
- Offer a program for trainees to advance in their jobsite roles through documented training
- Allow experienced trainees to "test-out" according to NCCER guidelines to verify their current knowledge

PROGRAM ACCREDITATION AND AFFILIATION

POWER52's Energy Professional Training program is accredited by The National Center for Construction on Education & Research (NCCER). NCCER is a not-for-profit 501(c)(3) education foundation created in 1996 as The National Center for Construction Education and Research. NCCER is headquartered in Alachua, Florida, and is affiliated with the University of Florida's M.E. Rinker, Sr. School of Construction Management. POWER52 will be responsible for the administration of the NCCER training curriculum.

NCCER's Registry system is a secure database maintained by NCCER to help manage Power52's training and assessment program. NCCER's industry-recognized credentials provide trainees with national portability of skills.

Each trainee will be given a full set of NCCER credentials that include:

- Certificate of completion
- Wallet card with ID number
- Transcript

Trainees can use the Registry to review their credentials. The registry provides access for trainees to have the ability to review their own training history and assessment history.

POWER52 is a North American Board of Certified Energy Practitioners (**NABCEP**) Official Provider.

It is the responsibility of the POWER52 Foundation to ensure that proper recordkeeping procedures are in place and adhered to concerning training for the trainee. In addition, POWER52 will be responsible for appropriate certification and training of appropriate personnel.

GENERAL INFORMATION

The policies and procedures explained in this document apply specifically to the training program of POWER52. POWER52 will serve as the sponsoring body in the NCCER program of Accreditation for training and provide services to all contracted entities under this sponsorship as requested or required. As such, policies stated within this document can be understood to apply to any NCCER certifiable training conducted by POWER52.

APPROVAL AUTHORITY

Approval for participation in POWER52's Training Program or authorized training programs remains the exclusive right and decision of POWER52.



STAFF

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CRAFT INSTRUCTOR SELECTION

Instructor candidates are to be selected on the basis of their ability to communicate and assist others in a positive and informative manner. POWER52 will ensure all Instructor candidates must be at minimum, journey-level or technician level in the craft they are to teach, have worked in the craft field for a minimum of two years or they must have a minimum of three (3) years-experience as a certified teacher in a vocational/technical construction, maintenance, or pipeline-related training program. In addition, instructors of this craft must:

- Possess a minimum of journey-level electrician experience
- Minimum of one year field experience installing solar PV panels

NCCER Requirement: Instructors must achieve certification by completing an Instructor Certification Training Program (ICTP) presented by a Master Trainer with current credentials. This requirement for certification shall be understood to apply to any instructor providing training as required by that material and extends to any

third-party provider (vocational schools, community colleges, partnering trade association chapters, etc.) of instruction or training.

CASE MANAGEMENT

POWER52 Foundation provides trainees a unique access to essential services and support. Trainees are provided one-on-one case management services that effectively aid in navigating solutions to reduce and resolve barriers directly connected to one's ability to be employable. Trainees receive investment planning strategies, individual career portfolio development, understanding of social and cultural workplace environments, as well as training in understanding the influence of technology and social media in the workforce. The trainees also have access to conflict resolution and mediation services, employment skills assistance, GED/college connections, financial literacy, computer skills, parenting skills, legal aid (child support and custody issues), food, clothing, tutoring and transportation assistance.

ADMINISTRATIVE POLICIES & PROCEDURES

STATEMENT OF NON-DISCRIMINATION

POWER52 does not discriminate on the basis of race, sex, creed, color, national origin, sexual orientation, disability, or age in admissions or treatment in its programs and activities, including advertising, training, placement, and employment and provides equal access to the trainees. The following person has been designated to handle inquiries regarding the non-discrimination policies:

POWER52 Foundation (Administrative Office)
Cherie Brooks, President/CEO
8775 Cloudleap Ct., Suite 11, Columbia, MD 21045
(410) 203-1255

All matters will be addressed equitably and promptly to resolve complaints. Responses will be provided within seven business days. For further information on notice of non-discrimination, visit <http://wdcrobcolp01.ed.gov/CFAPPS/OCR/contactus.cfm> for the address and phone number of the office that serves your area, or call 1-800-421-3481.

AFFIRMATIVE ACTION

It is the policy of POWER52 to interview and enroll trainees without regard to race, color, creed, age, gender or national origin. Furthermore, POWER52 has provided accessibility and utilization of public facilities for physically limited persons. All matters relating to training and educational opportunities will be free from any and all discriminatory practices. All persons with a sincere interest in career opportunities are encouraged to make application to the school.

TRAINING FACILITY

The Power52 Energy Institute Howard County is located at 8775 Cloudleap Court, Ste 11, Columbia , MD 21045. Located just minutes off I-95S via Rt. 175 W in the heart of Columbia, Power52 Energy Institute Howard County features 3,115 sq. ft. of space including approximately 1,500 sq. ft of training and classroom space and 1200 sq. ft of office space , and 415 sq . ft of storage space.

Branded with the POWER52 logo, our classroom is 1,500 square feet with (13) thirteen (2) two seater tables, with a seating capacity of 26. The room is also equipped with a smart board, a dry erase board, a supply cabinet, books, and other necessary items. There are two solar panels on the front wall of the classroom to bring forth the feel of the solar fields. Laptops are made available for use as needed. A coed restroom and a break room is located inside the training center.

POWER52 will provide adequate space and layout to carry out instruction and training with the required training equipment for realistic methods and procedures. POWER52 will supply adequate/appropriate materials, tools, and equipment needed to support the class size and instructional content for instructors and trainees.

TRAINING FACILITY REQUIREMENTS

Training itself may consist of formal classroom setting, computer-based learning, self-study or a combination of delivery. In all cases, a certified Instructor or one approved/designated by the Site Representative will be responsible for the training and documented results.

POWER52 will provide adequate space and layout to carry out instruction and training with the required training equipment for realistic methods and procedures. POWER52 will supply adequate/appropriate materials, tools, and equipment needed to support the class size and instructional content for instructors and trainees.

The physical facilities will be well maintained and organized to accommodate teaching/learning /assessment activities such as lectures, discussions, laboratory work, module written & performance tests, administering assessments and performance verifications. The nature of training and/or assessments imposes a need for special types of space and equipment to provide for realistic construction, maintenance, and pipeline methods and procedures. It is important that the facilities be arranged to encourage interaction as warranted. The physical facilities must meet all regulatory and POWER52'S safety and health requirements.

TRAINEE RIGHTS

Statement of trainee's rights, privileges and responsibilities: It is a trainee's right to receive the training for which he was enrolled. It is the trainee's privilege to be trained at the time and site that he expected. It is the trainee's responsibility to attend classes regularly, study so as to complete the program, and to respect the school's rules and regulations. It is the trainee's responsibility to participate in workstation and classroom clean-up. It is also the responsibility of the trainee to pay all active meters for parking.

HEALTH/MEDICAL CARE

Trainees who become seriously ill or contract a communicable disease should stay at home and recover, but remember to notify the school immediately. All medical and dental appointments should be made before or after school hours when appropriate. POWER52 training staff will provide trainees with a first-aid kit for instances of sudden injuries. During extreme emergencies Power52 staff will call 911 for medical assistance.

DRESS CODE

Power52 maintains a dress code that encourages both safety and professionalism. Faddish attire is not acceptable. No hats are to be worn in class. Trousers/pants should be clean and presentable and should not be worn in a manner that would prevent freedom of movement. Shorts and sweat pants are not acceptable. Pant leg length must be, at the minimum, to the ankles. Excessively long pant legs which drag on the floor are a safety hazard and not acceptable. All trainees must wear properly laced and tied safety shoes. Closed-toe shoes must be worn at all times. Safety glasses must be properly utilized in designated areas. Length of hair is not only a professional issue, but a safety concern. Hair worn long must be tucked inside the shirt collar, tied up when around tools/equipment. Only ear studs less than 1/4" are permitted. Earrings that dangle are not allowed. Absolutely no jewelry is permitted in the lab due to shock hazard.

ADMISSION PROCEDURES & REQUIREMENTS

All adult applicants must be at least 18 years of age, but shall not be older than 50 years of age upon application and present a current driver's license, state ID, or birth certificate and social security card. Applicants 17 years of age may be referred from pre-approved High Schools for the Intro to Energy Professional Training Program in Howard County. Those applicants must be at least 17 years of age, currently certified High School Seniors, and set to graduate within that school year. All applicants are required to pass an entrance test prior to acceptance into the program with a 10th grade Minimum TABE score. Applicants not obtaining the minimum cut score will be offered the opportunity to retake the required TABE assessments upon completion of all required refresher courses, such as basic Math and English that will be facilitated by their assigned case manager. All applicants must possess a high school diploma or GED. Non-high school (or GED) graduates and foreign applicants who have the ability to benefit from the training offered by the school will be given the opportunity to enroll in the GED classes as facilitated by their case manager. Upon successfully passing the GED exam the trainee will be enrolled at the start of the next cohort. Applicants unwilling to enroll in GED classes will no longer be eligible to continue the admissions process for the Power52 Energy Professional Training Program. Applicants who do not qualify for admission with Power52 will work with their case manager to research outside classes or opportunities that do not require a GED/ high school diploma or higher. Due to limited space in each class and the time involved in testing/processing, trainees are encouraged to schedule an appointment with a counselor and apply as early as possible. Appointments are made available Monday — Friday 9:00 am - 4:00 pm at the Power52 Energy Institute located at 8775 Cloudleap Court, Suite 11, Columbia, MD 21045.

RE-ADMISSION

Trainees who have been terminated and wish to re-enroll will become eligible for re-admission into the Power52 training program only after training for the following cohort has been completed. Trainees may request reinstatement by contacting Cherie Brooks, School Director, via email at Cherie@POWER52.org to request a re-entry meeting. A review of the trainee's educational transcript, prior attendance and participation in class is reviewed to determine if a meeting will be granted. After review and consideration of the trainee's academic progress, the school director will determine if a re-entry meeting will be granted. If a meeting is granted the school director and trainee will determine a strategic academic plan for re-entry. All trainees readmitted must repeat the necessary modules to become in satisfactory status and will be required to sign a new enrollment agreement. A maximum of one reinstatement past the original start date will be allowed, with mitigating circumstances approved by the school director. If a meeting is not granted by the director, a denial letter will be emailed to the trainee.

FEES

POWER52 does not charge fees for tuition, training materials, tutoring or certifications. Each trainee will be provided with a training manual, usage of classroom materials, and a **one-time** sitting fee for the NABCEP Exam. Additional exams may be taken for two years after the completion of the program at a cost to the trainee of \$125 per re-take. A trainee may sit for a NABCEP Associate Exam up to six times every 12 months.

PROFESSIONAL SERVICES

POWER52 offers trainees the following career services: professional development advising, assistance with employment applications, resumes, and cover letters. These services are made available during the Life Skills module of the program curriculum as well as by appointment with their appointed case manager.

TRANSPORTATION ASSISTANCE

POWER52 maintains information on trainees interested in carpooling. Bus cards may be available upon request. The school also maintains current bussing information. Transportation to and from school is the trainee's responsibility.

POWER52 Energy Professional Training is offered on the following schedules:

Day Schedule:

Monday through Friday (30 clock hours per week/11 total weeks/320 total clock hours)

Class: 9:00 a.m. to 3:30 p.m

Lunch: 30 minutes

Evening Schedule:

Monday through Friday (20 clock hours per week/16 total weeks/320 total clock hours)

Class: 5:00 p.m. to 9:00 p.m

CLASS SIZES

The number of trainees assigned to each class is based on a trainee teacher ratio that provides adequate time allocation to each individual in classroom instructional and lab. The maximum trainee to instructor ratio for lab is 25:1. The maximum trainee to instructor ratio for classroom lecture is 25:1.

ACADEMIC/ATTENDANCE PROGRESS STANDARDS POLICY

GRADING STANDARDS

NCCER *Curriculum* training will consist of the following exams:

- A closed-book, written exam with an achieved score of 70% or higher
- A performance (hands-on) exam successfully completed to the satisfaction of the instructor using the criteria provided by NCCER in making his/her evaluation (This is a pass/fail test.)

Monthly progress reports are given to each trainee so that they are aware of their progress. Upon completion of training, grades are verified and a final transcript is furnished to the trainee, based on a numerical system. Trainees attending the programs are graded by written exams and quizzes (theory based), and labs (practical). For purposes of comparison, the relationship between numerical and letter grades is shown below.

THEORY EXAMS

A = 90 – 100%

B = 80 – 89%

C = 70 – 79%

F = Below 70%

CPL = Credit for Prior Learning

PERFORMANCE EXAMS

P = PASS

F = FAIL

Note* Academic records are subject to inspection by the Maryland Higher Education Commission and maintained by POWER52 in perpetuity.

ACADEMICS

Craft Instructors will have a weekly meeting with trainees who are in jeopardy of academic expulsion to develop a plan of remedy. Monthly progress reports will serve as an evaluation checkpoint that will inform trainees if they are maintaining the required grade point average of at least 70% and a 95% attendance rate. Trainees who do not achieve the required academic and attendance minimum are placed on probation until their unsatisfactory requirements are remedied. Trainees on probation longer than a 30-day probationary period will be withdrawn from the training program.

Make up work must be scheduled with the instructor and completed prior to taking any final exams including NABCEP. Program make up clock hours must be scheduled directly with the instructor at a mutually agreed upon make up day and time. A trainee may be allowed to attend a session at another Power52 Energy Institute, schedule evening hours with the instructor, or possibly make up time over the weekend. Make up classes must be pre-approved by the instructor. Instructors are approved to **only** take a maximum of five (5) additional trainees at a time for make-up sessions outside of normal class/lab time. No trainee will be allowed to graduate until all missing assignments are accounted for.

A trainee who has taken any particular module previously at the Power52 EPTP or a NCCER accredited training facility and successfully completed it with passing grades; once the information is verified in the NCCER Registry, the trainee will receive credit for prior learning (**CPL**) for those exams associated with the verified module; however, that **CPL** will not have an effect on their current GPA. The trainee **will** be required to attend classes, but sitting for the exam will not be required.

PROGRESS REPORTS

Craft Instructors will have a weekly meeting with trainees who are in jeopardy of academic expulsion to develop a plan of remedy. Trainees will receive a progress report once a month, at which time all grades and attendance will be evaluated and reported in writing to the trainees. The instructor will provide the trainee with constructive comments/feedback. Upon receipt of the progress report, the trainee will also be given an instructor survey to be completed and submitted the same day.

ATTENDANCE

All trainees will be required to attend classes as scheduled and on time with no grace period. Attendance rosters will be taken at the start of each class. Every fifteen (15) minutes late will equal one (1) clock-hour. Absences, including tardiness and leaving early will be tracked and shall become a part of the trainee's permanent record. Trainees who are absent for twelve (12) clock hours will be placed on attendance probation, regardless of whether the missed clock hours have been made up. When placed on attendance probation the student will be notified that they are in jeopardy of being dropped from the program. Any trainee missing twenty-four (24) clock hours or more will be dropped from the program. Documentation will be maintained in the permanent file for each trainee regarding attendance. Trainees must sign-off on the daily attendance form in order to receive credit for the clock hours. Students can make up their clock hours missed; but the clock-hours missed will count towards their attendance rate which cannot be less than 95%. All trainees must complete the training program in a minimum of 320 clock-hours and a maximum of three hundred forty-four (344) clock-hours.

**Please reference the academic policy for the process of making up clock hours on p. 9.*

Exam Assessments: The doors are closed at the start of the session. Any participant arriving after the doors are closed will not be allowed to take the assessment. They will be required to report to their Instructor and request rescheduling of the assessment. Trainees will be able to take this time to meet with their case manager or wait in the lobby enter the training room once the exam is over.

ATTENDANCE PROBATION POLICY

Any trainee that has missed a total of twelve (12) clock hours will be put on attendance probation. The trainee will be required to make up the necessary clock hours to achieve the 95% attendance rate to graduate. Once the 95% attendance rate is achieved, the trainee will be removed from attendance probation. If the trainee fails to achieve the 95% attendance rate, he or she will be terminated from the program. Trainees who have been terminated and wish to re-enroll will become eligible for re-admission into the Power52 training program only after training for the following cohort has been completed. Upon re-admission, a new enrollment agreement must be completed. For further guidelines, please reference the re-admission policy.

LEAVE OF ABSENCE POLICY

Due to the short time frame of the training program we do have a leave of absence policy in place. Any trainee in need of a leave of absence will be advised to take the class at a later date.

TRAINING VERIFICATION

All training sponsored by POWER52 (whether internally provided or through a third-party provider) must include a verification or testing process that will demonstrate successful completion of the training. The details of this process must be provided to both instructors and trainees at the beginning of instruction, prior to the administration of the first test.

NCCER *Curriculum* training will consist of the following tests:

- A closed-book, written test with an achieved score of 70 percent or higher
- A performance (hands-on) test successfully completed to the satisfaction of the instructor using the criteria provided by NCCER in making his/her evaluation (This is a pass/fail test.)

Should the trainee fail the written test, he/she may retake the written test after a minimum waiting period of forty-eight (48) hours. A trainee who has taken the written test two (2) times and does not attain the minimum 70% score will be allowed to re-take the same exam a third time after a minimum of ten (10) days provided that they have arranged scheduled tutoring with the instructor and/or WASP. If there is less than ten (10) days remaining in the 11-week training session the trainee must retake the test during the next scheduled cohort. A newly completed cohort intake form will be required. Performance test retakes will be

given at the discretion of the Craft Instructor/Performance Evaluator whether immediately or at a later time designated by the Craft Instructor/Performance Evaluator.

“Testing out” will **not** be permitted; however, a trainee who has taken any particular module previously at a NCCER accredited training facility and successfully completed it with passing grades, once the information is verified in the NCCER Registry, the trainee will receive credit for prior learning (**CPL**) for those exams associated with the verified module; however, that **CPL** will not have an effect on their current GPA. The trainee will be required to attend classes, but sitting for the exam will not be required.

TEST PROCEDURES AND SECURITY

Test results will be entered into the trainee’s permanent record. Those results will be maintained and stored in perpetuity by POWER52. All scores, skill assessment prescriptions, program applications, program approvals, sign in sheets, trainee enrollment agreements, transcripts, etc. will be filed in a secured physical and electronic filing system and entered into the corporate training database.

Administration of module written tests are to follow the time frame specified in the Instructor’s Guide for that particular test. The classroom will be arranged so that the trainees cannot observe other trainees’ tests. Talking or discussion of the tests while being conducted is prohibited. Written tests are then collected and graded by the Instructor. Questions and discussion on the tests may be reviewed and answered in class or privately with the individual trainees.

TUTORING

A trainee who feels he/she is having difficulty with a module is urged to request assistance from the Instructor. Hours for Instructor tutoring sessions can be available on weekdays, weekends, before or after class hours.

FIELD TRIPS

POWER52 believes that training is enhanced by real life applications. When appropriate, visits may be arranged to industrial or professional locations.

SPECIAL LECTURES

Guest lecturers are invited to speak to trainees about career opportunities and current industry applications of educational programs.

CONDUCT OF CLASS

Instructors are required to arrive to the class site fifteen (15) minutes prior to start time to ensure the following:

- Facility access (includes ADA accommodation as required)
- Proper classroom set-up (seating) and climate control
- Appropriate audio-visual equipment and power supply
- Adequate amount of training materials (books or manuals for each trainee, testing equipment, etc.)
- Adequate safety provision (entrance and exit, fire extinguishers, first aid kits and/or trained personnel, emergency phone numbers and phone access, safety audit of equipment, tools and materials to be used, etc.)
- Attendance recording

All instructors are required to provide their trainees with Power52’s approved policies concerning their participation in the program. These policies should be provided in writing and the instructor should make every effort to ensure that the trainees understand these policies. These policies should include, but not be limited to:

- Class times and attendance policies

- Classroom conduct and appearance
- Testing and results procedures
- Safety procedures
- Equipment and material handling (including HAZCOM or MSDS issues)
- Expectations of the training program

All instructors are expected to present a professional appearance and manner, and be available to trainees (for a reasonable time period) for discussion and/or consultation outside of the normal classroom environment. Instructors should be made aware that they are not just “teaching” the material, but to a smaller or greater extent serving as a role model for those people who wish to develop their skills and advance their careers with POWER52 and within the industry. Instructors are required to ensure the security of training materials, equipment, and NCCER *Curriculum* tests under their control. Any breach of this security or awareness of the same is to be reported to the school director immediately.

These policies apply to all third-party providers of training contracted and conducting services for POWER52.

CANCELLATION OF CLASSES

In the event of inclement weather, school may be canceled or delayed. A group text will be sent or call the school for a recording regarding any delays or cancellations. The program schedule will be modified to accommodate for all missed days due to inclement weather.

PROGRAM EVALUATION

Trainees are required to evaluate the training program and instructor prior to graduation. Evaluation forms must be completed and submitted to the Instructor by the last day of class.

RELEASE OF INFORMATION

All trainees will be required to complete and sign a registration and release form authorizing the POWER52's Administrator to verify training and/or assessment information of NCCER training. This release form will also authorize NCCER to verify this information to other NCCER Accredited Training Sponsors/Assessment Centers as appropriate and requested. Signature of this release form will hold harmless NCCER as well as POWER52 and its member companies for this verification process. POWER52 will not provide any training and/or assessment records of any trainee who participated in training and/or assessment program(s) without prior written request and consent of that specific individual.

TOBACCO USAGE POLICY

Any and all tobacco usage is prohibited throughout all classrooms, offices, restrooms, break rooms and faculty offices. Failure to comply with the POWER52 tobacco usage policy can result in discipline measures including suspension and ultimately termination of training. Smoking or congregating outside the facility is allowed in designated areas only.

DRUGS, SUBSTANCE ABUSE, ALCOHOL AND FIREARMS POLICY

POWER52 intends to help provide a safe and drug-free work environment for our clients and our trainees. With this goal in mind and because of the serious drug abuse problem in today's workplace and training programs, we are establishing the following policy for existing and future trainees and trainees of POWER52.

Power52 explicitly prohibits:

- The use, possession, solicitation for, or sale of narcotics or other illegal drugs, alcohol, or prescription medication without a prescription on POWER52, training facility, or on-site training or retreat premises or while performing assignments.
- Being impaired or under the influence of legal or illegal drugs or alcohol away from the POWER52 or training premises, if such impairment or influence adversely affects the trainee's work performance, the safety of the trainee or of others, or puts at risk the POWER52's reputation.

- Possession, use, solicitation for, or sale of legal or illegal drugs or alcohol away from the POWER52 or training premises, if such activity or involvement adversely affects the trainee's work performance, the safety of the trainee or of others, or puts at risk the POWER52's reputation.
- The presence of any detectable amount of prohibited substances in the trainee's system while riding/driving any of POWER52's vehicles, while on the premises of any class sites, or while on POWER52 business. "Prohibited substances" include illegal drugs, alcohol, or prescription drugs not taken in accordance with a prescription given to the trainee.

It is the policy of POWER52 to maintain a work environment that is safe for all persons, including the community, and conducive to attaining high work standards. To achieve these objectives, the POWER52 is committed to a strong stand against firearms and weapons in the work environment.

It is POWER52's policy to maintain a firearms and weapons free work place and prohibit the possession of firearms and weapons regardless of any license which would otherwise authorize or permit that an individual may have to carry firearms or weapons. POWER52 will strictly enforce this policy.

PROHIBITED CONDUCT

(a) The transportation of firearms or weapons in school vehicles is prohibited. This includes but is not limited to, (1) to and from class, (2) when conducting training, (3) at all times in school-owned or leased vehicles.

(b) The carrying of permitted and non-permitted firearms while at training centers, parking lots, sponsored events, outreach events and job sites.

(c) The carrying of weapons while at training centers, school offices, parking lots, sponsored events, and job sites.

(d) Exception: power actuated tools which are manufactured for the use of fastening building materials are not part of this policy.

SUBSTANCE ABUSE DISCIPLINE

(a) Violations of any portion of this policy will result in the trainee's immediate expulsion from the training program.

(b) Violations by a trainee in any portion of this policy will constitute insubordination and serious misconduct that will mandate the trainee for immediate removal from Power52's premises, and barring future access to any Power52 premises and programs.

DRUG ABUSE PREVENTION

Referral to an offsite drug abuse prevention program is available to any trainee of the POWER52 program. If you feel there are needs that need to be addressed, please contact your instructor. Referral to the appropriate program will be made by the **case manager**. * Please see *the Drug Policy on p.12*.

HARRASSMENT POLICY

Harassment is any annoying, persistent act or actions that singles out any trainee to their objection or detriment because of race, sex, age, religion, ancestry, national origin, physical handicap, mental condition, marital status or veteran status. Harassment may include any of the following:

- Verbal abuse or ridicule. This includes abusive or derogatory comments, slurs or unwanted sexual advances, invitations or comments.
- Interference with a trainee or trainees work. This includes physical contact such as assault, blocking

normal movement or interference with work directed at an individual because of his/her sex or other protected status.

- Displaying or distributing sexually offensive, racist or derogatory materials. This includes derogatory posters, cartoons, drawings, gestures or intimate physical contact.
- Demanding favors (sexual or otherwise).
- Retaliation for having reported harassment.
- Harassment is grounds for disciplinary action up to and including termination and those who feel they have been harassed must report it immediately to their instructor or to the Institute's School Director. The school will change the victim's academic situation, if changes are requested by the victim, and are reasonably available. The school Director will act in accordance with the school crime awareness and campus security policy.

POWER52 is committed to full compliance with applicable local, state, and federal laws. POWER52 will ensure all registering of individuals, training program administration, testing, credentialing, and release/reporting of information will be conducted without regard to race, color, religion, national origin, gender, age, veteran status, physical or mental disability, sexual orientation, or any other reason prohibited by local, state, or federal regulations. Harassment of any kind by any instructor, classmate, case manager, or staff member is improper and will not be tolerated.

TRAINEE CONDUCT AND DISCIPLINE

The following statements define some behaviors that are not in harmony with the educational goals of POWER52 Training Program:

- Academic dishonesty such as cheating, plagiarism or knowingly furnishing false information to the school.
- Forgery, alteration, misuse or mutilation of institute documents, records, identification, educational materials and institute property.
- Obstruction or disruption of teaching, administration, disciplinary procedures or other school activities including public service functions or other authorized activities on or off premises.
- Physical or verbal abuse of any person or conduct which threatens or endangers the health or safety of another.
- Theft or damage to property of POWER52 and partners; using or attempting to use school property in a manner inconsistent with its designed purpose. This includes any surveillance equipment.
- Unauthorized entry to; or use of; or occupation of school facilities.
- Intentional or unauthorized interference with a right of access to school facilities or freedom of movement or speech of any person on the premises.
- Use or possession of firearms, ammunition or other dangerous weapons, substances or materials or bombs, explosives or incendiary devices prohibited by law.
- Disorderly or lewd conduct, indecent or obscene conduct or expression.
- Violation of federal, state and local ordinance including, but not limited to, those covering alcoholic beverages, narcotics, gambling, sex offenses or arson, of which a violation occurs on school property or at a school function (Please refer to the Drug Free Policy established by the school)
- Rioting, aiding, abetting, encouraging or participating in a riot.

- Allowing access to the school to unauthorized persons, children are not permitted in the building at any time.
- Failure to comply with verbal or written directions of any school official acting in the performance of his/her duty and in the scope of his/her authority or resisting a security officer while acting in the performance of his/her duties.
- Aiding and abetting or inciting others to commit any act of misconduct set forth in the above listed.
- Charging of a crime in which is of a serious nature (in the determination of the school's director) is enough to warrant discipline. Upon filing of charges in court involving an offense of a serious nature; and it is administratively determined that the continued presence of the trainee would constitute a threat or danger to the school community, such trainee may be temporarily expelled pending disposition of the charges in court.
- Refusal to abide by the trainee dress code policy.
- Speaking negatively about a fellow classmate or trainee of the school, encouraging rumors about the school or other trainees.

Violation of the fore-listed areas of conduct may subject the trainee to any of the following:

- Verbal Reprimand
- Specific restrictions imposed
- Expulsion

After being expelled, a trainee may be readmitted only after a written request is approved by the school director. Readmission will be on a probationary basis. Trainees returning must follow the reinstate procedure outlined in this catalog in the re-admissions policy on p. 8. Any other infractions will result in permanent expulsion. POWER52 understands that trainees have certain rights, which must be respected, just as they must respect their obligation to the school. Rights however are not absolute. Along with every right is a corresponding obligation and duty to respect the rights of others, to adhere to all reasonable rules and regulations established for the government of the school, the damaging of the property, rights and possessions of others. It becomes incumbent on the part of all trainees to follow the school's code of trainee conduct prescribed for the operations of POWER52. Any other offenses in which may be detrimental to the trainees, faculty, administration, staff or graduates of POWER52 may result in the aforementioned penalties at the determination of the school director.

EXPULSION

A trainee may be expelled for failure to adhere to the school's trainee conduct policy or failure to make acceptable academic or attendance progress.

Expulsion from participation in the POWER52 training program is based on objective criteria. Some reasons for considering the expulsion of a trainee include, but are not limited to, the following:

- A trainee that is absent, four calendar days (24-clock hours) from scheduled class sessions (This is an indication that the trainee is unable or unwilling to attend regularly.)
- A trainee's conduct violates project or training program guidelines

There may be other reasons that warrant consideration of expulsion. Determination to remove trainees from training will be made by the school director with recommendation from the instructor. Some circumstances

may be straightforward with the trainee in full agreement. Others may be controversial. If trainees disagree with the alleged reason(s) for expulsion, the instructor will document their position and ensure that trainees are clearly informed of the reason(s) for removing them from program.

APPEALS OF EXPULSION DECISION

Within forty-eight (48) hours of the date of the expulsion notice the trainee has the opportunity to request a meeting with the POWER52 Instructor to discuss their expulsion from participation in the training program. If a trainee offers documented information that could potentially reverse the expulsion decision, the information will be accepted and given due consideration by the school director. The school director will render all final decisions.

GRIEVANCE/APPEALS PROCESS

Grievance: In the event a trainee has a complaint pertaining to the training program, facilities, instructor, or POWER52 policies; he/she should discuss the situation with the individual(s) or personnel involved within forty-eight (48) hours. If the problem cannot be resolved, the individual filing the complaint should submit a written statement describing the nature of the issue to the school's director. The director will review the statement and provide a solution within ten (10) days. If unable to reach a satisfactory response from the director, the individual must submit a statement to NCCER within the next thirty (30) days (no longer than forty (40) days from the initial written statement). The statement should include contact information (name, address, phone number, email address, etc.). The statement must also be dated and signed by the individual. At that time, NCCER will investigate the complaint and make an independent determination as to its validity. If the complaint is found to be valid, NCCER will notify POWER52 and ask that the correction be made. NCCER will require documentation provided in a timely manner to verify that corrective action has been taken. NCCER will communicate determination to the individual and POWER52 within sixty (60) days of the written notice to NCCER. NCCER, 13624 Progress Blvd., Alachua, FL 32615, 888.622.3720, <https://www.nccer.org/>.

Appeals: The trainee should go through POWER52's initial grievance process first. If no remedy satisfies the trainee, then she/he may file an appeal in writing to the Secretary of Higher Education at the Maryland Higher Education Commission concerning school violations of Maryland regulations and school policy. Maryland Office of the Attorney General, Consumer Affairs, 200 St. Paul Place, Baltimore, MD 21202, 888-743-0023/410-528-8662.

MITIGATING CIRCUMSTANCES

The school director may waive interim satisfactory standards for mitigating circumstances outside of the control of the trainee. Mitigating circumstances are defined as: death of a relative, injury or illness of trainees, or other special circumstances. The school director must approve all mitigating circumstances. Trainee will be required to make up necessary clock hours and exams to fulfill graduation requirements. A trainee may only acquire one waiver in any program session. It must be demonstrated by the trainee and documented by a physician (if medical conditions are implicated) that the circumstance had an adverse impact on the trainee's satisfactory progress in his/her academic program. No waivers will be permitted for graduation requirements.

EXAMINATION OF TRAINEE RECORDS

Under the authority of the Family Educational Rights and Privacy Act of 1974, trainees have the right to examine certain files, academic records, and documents maintained by the institute which pertain to them. Academic records are subject to review by the Maryland Higher Education Commission and maintained by POWER52 in perpetuity. Trainees may request a review of their records in writing to the school director. Such review will be allowed during regular business hours under appropriate supervision. Trainees may request that the training program amend their educational records on the grounds that they are inaccurate, misleading, or in violation of their right to privacy. Challenging the records for the purpose of correcting or deleting any of the contents must be done in writing with the reason fully stated. However, grades and program evaluations can only be challenged on the grounds that they are improperly recorded. Challenges must be made with written consent. The procedure is as follows:

- The instructor involved will review the written challenge and meet with the trainee. A decision will then be made to retain, change or delete the disputed information.
- Should further review be requested, a grievance hearing will be held with the training program's school director at which time the trainee is afforded a full and fair opportunity to present evidence relevant to the disputed issues. The school director will then make a final recommendation.

A copy of the challenge and/or written explanation of the contents will then be included as part of the trainee's permanent record.

GRADUATION REQUIREMENTS

- Completion of three hundred twenty (320) clock hours of instructor and lab training.
- Completion of all required module written exams with a passing grade of at least 70% and "Pass" for all performance exams.
- Attendance rate no less than 95% of the scheduled clock hours of the program.
- Completion and submittal of Instructor/Program evaluation form.
- Attend an exit interview.

JOB PLACEMENT

POWER52 has established an Industry Partner Network that has committed to employ our graduates for clean energy projects either originated or constructed by its organization. POWER52 Foundation cannot guarantee job placement or salaries earned.

TRACKING JOB PLACEMENTS

Case managers will use a shared database to track placement information including employer, industry, starting wage, and benefits. In addition, case managers will provide employment retention support to program graduates for up to one year with a minimum monthly check-in and connection to additional supportive resources.

PROGRAM PERFORMANCE

Trainees and prospective trainees may obtain from the Maryland Higher Education Commission information regarding the performance of each approved program. This includes but is not limited to information regarding each program's enrollment, completion rate, placement rate, and (if applicable) pass rate of graduates on any licensure examination. The web site address of the Maryland Higher Education Commission is <http://www.mhec.maryland.gov>.

POLICY AND PROCEDURE CHANGES

The policies and procedures for administering these programs are subject to change by POWER52 or where those policies are required by NCCER. All proposed policy revisions will be submitted to the Maryland Higher Education Commission for review and approval before implementation.

WORKPLACE HEALTH & SAFETY POLICY

POWER52 places the highest possible emphasis on workplace health and safety. This policy aims to remove or reduce the risks to the health, safety and welfare of all trainees, trainees, and visitors. Accidents on a worksite are not only costly for the owner of the site, but also the developer, the contractor, the subcontractor and the trainee to whom the accident occurred. In order to avoid such instances and ensure a safe, productive workday for all involved, the following safety program must be strictly adhered to.

At the beginning of each workday, the class trainer or site supervisor shall review with all trainees the Safety Procedure sheets that apply to whatever equipment shall be used that day. Instructors and trainees are required to sign these sheets prior to beginning work that day. The Daily Pre-Job Safety Checklist shall also be completed and all these shall be submitted to the Project Manager. Any accidents/near accidents shall be reported promptly to the Project Manager and a Near Miss Accident Report and/or an Accident-Occupational Injury & Illness Report, as applicable, must follow within 24 hours.

SAFETY RULES

- Observe and practice the safety procedures established for the job.
- Report all possible hazards to your supervisor immediately.
- In case of sickness or injury, no matter how slight, report at once to your supervisor/instructor. In no case should a trainee treat his own or someone else's injuries. In case of any accident resulting in a severe injury, the trainee is not to be moved unless authorized by medical personnel.
- Never distract the attention of another trainee, as you might cause him or her to be injured. If necessary to get the attention of another trainee, wait until it can be done safely.
- Do not wear loose clothing or jewelry around machinery.
- Where required, you must wear protective equipment, such as goggles, safety glasses, masks, gloves, hard hats, etc.
- Do not operate machines or equipment until you have been properly instructed and authorized to do so by your supervisor/instructor.
- Keep your work area clean.
- Observe NO smoking regulations.
- Do not tamper with fire extinguishers or smoke detectors.
- Electrical accidents are a leading cause of fatalities in workers. Assume that all wires are live wires and treat them accordingly.
- Do not engage in practices that are inconsistent with ordinary and reasonable common sense safety rules.

Signature:

By signing below, you acknowledge receipt of the policies as listed above. You further acknowledge that you have read, understand, and accept each policy in its entirety. You acknowledge that you have retained the policies for your records and will abide by the policies accordingly. This Safety Policy Form will become part of your trainee record.

Signature

Print Name

_____/_____/_____
Date

NEAR MISS INCIDENT REPORT

Date: _____

Submitted By: _____

Dept.: _____

1. Injury Potential Fatal Serious Minor

2. Location where incident occurred: _____

3. Witnesses: _____

4. Date of Incident: _____ Time: _____ AM PM

5. Brief Description: _____

Indicate if any of the following were a factor in the incident:

| Equipment | Safety Devices | Operating Conditions | Protective Equipment |
|---|---------------------------------------|--|---------------------------------------|
| <input type="checkbox"/> Mechanical Failure | <input type="checkbox"/> Inadequate | <input type="checkbox"/> Unsafe Act | <input type="checkbox"/> Inadequate |
| <input type="checkbox"/> Electrical Failure | <input type="checkbox"/> Defective | <input type="checkbox"/> In safe Condition | <input type="checkbox"/> Defective |
| | <input type="checkbox"/> Not Provided | <input type="checkbox"/> Weather | <input type="checkbox"/> Not Provided |
| | <input type="checkbox"/> Not Used | | <input type="checkbox"/> Not Used |

SUBMIT TO PROJECT MANAGER WITHIN 24 HOURS OF INCIDENT

Accidental-Occupational Injury and Illness Report

Submitted By: _____

Trainee Number: _____ Date: _____

Dept.: _____

1. Injury Type: _____

2. Location of Accident: _____

3. Witnesses: _____

4. Date of Incident: _____ Time: _____ AM ___ PM

5. Brief Description: _____

Indicate if any of the following were a factor in the incident:

| Equipment | Safety Devices | Operating Conditions | Protective Equipment |
|---|---------------------------------------|--|---------------------------------------|
| <input type="checkbox"/> Mechanical Failure | <input type="checkbox"/> Inadequate | <input type="checkbox"/> Unsafe Act | <input type="checkbox"/> Inadequate |
| <input type="checkbox"/> Electrical Failure | <input type="checkbox"/> Defective | <input type="checkbox"/> In safe Condition | <input type="checkbox"/> Defective |
| | <input type="checkbox"/> Not Provided | <input type="checkbox"/> Weather | <input type="checkbox"/> Not Provided |
| | <input type="checkbox"/> Not Used | | <input type="checkbox"/> Not Used |

6. Action(s) taken to prevent reoccurrence: _____

SUBMIT TO PROJECT MANAGER IN 24 HOURS

Daily Pre-Job Safety Checklist

| Chemical/Hazmat List | | |
|----------------------|-----|------------------|
| Name | Use | Safety Procedure |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

| Safety | | Today's Toolbox Talks: | |
|------------------|------|------------------------|------------------|
| Inspections | Pass | Fail | Inspection Notes |
| Ladders: | | | |
| Scaffolding: | | | |
| Tools: | | | |
| Cords: | | | |
| GFCI: | | | |
| Fall Protection: | | | |
| Vehicles: | | | |
| Equipment: | | | |
| PPE: | | | |

| Contractor Attendance Sign-In |
|-------------------------------|
| |
| |
| |
| |

Bloodborne Pathogens

Bloodborne pathogens are microorganisms present in human blood that causes diseases in humans. Workers can be exposed to bloodborne pathogens while performing work in certain environments. However, we can protect ourselves by preventing contact with human blood, urine, mucus and saliva.

- The diseases that are most likely to affect workers through exposure to bloodborne pathogens are hepatitis B (HBV) and human immunodeficiency virus (HIV), which causes acquired immune deficiency syndrome. (AIDS).
- To protect you from these diseases treat all blood and body fluids as if they are infectious.
- If you are attempting to help an injured worker, make sure you are wearing the proper personal protective equipment (PPE). The PPE should be readily accessible.
- At a minimum, you should wear rubber gloves and goggles designed specifically to protect the user from exposure to bloodborne pathogens.
- A breathing mask with a one-way valve should also be used if mouth-to-mouth resuscitation is required.
- Also, wear rubber gloves and a full-face shield when you are working in areas where blood and body fluids could be present. Examples are plumbing drain pipes (especially those in hospitals, urgent care centers, funeral homes, etc.) and waste water treatment plants.
- If you come in contact with blood or body fluid you should consider getting a hepatitis B vaccination within 24 hours following the exposure. Your employer is required to provide the vaccine if you decide to get one. Contact your supervisor immediately if there is exposure.

Damaged Power Tools and Equipment

- Each year in the United States there are more than 20,000 electrical accidents and 700 deaths related to electricity. Many of them occur as work related deaths.
- A significant amount of those fatalities are due to working with damaged electrical tools and equipment.
- Electrical tools can be extremely hazardous if they are damaged enough to cause the user to contact exposed live wires.
- Inspect each tool carefully before you use it. If there are cracks, cuts or abrasions on the cord, take the tool out of service until it can be repaired by a person qualified to do so properly. Don't try to fix it yourself.
- If the casing of a tool is broken or cracked anywhere, discard the tool in such a way that it won't be used by others.
- Check the plug carefully, too. If the plug is the three- prong type and a prong is missing, take the tool out of service until the plug is properly replaced.
- Before using the tool, check the area carefully for objects with sharp edges and other areas where the cord could be pinched, scraped or cut. Avoid these areas whenever possible. If you can't avoid them, take whatever measures are necessary to protect the cord.
- Store electric power tools in a waterproof toolbox when they are not in use. Remember that the cords and other parts of tools become weather beaten if not stored properly and insulation can rot away, exposing the wires.
- Avoid using all electrical powered tools in wet or damp locations without ground fault circuit interrupters. Never allow a power tool cord or extension cord to lie in a puddle of water.

Eye and Face Protection

Workers are exposed to eye hazards every day on the job. Countless workers have been spared eye injuries and blindness because they chose to wear eye protection. Not as important, but still worth consideration is the use of face protection for certain tasks.

- Depending on the source, flying particles can strike with a little bit of force or with a tremendous amount of force. When flying particles hit an eye, the potential damage range from temporary irritation to permanent blindness.
- Wear eye protection whenever there is potential for exposure to flying particles, chemicals or other eye hazards such as ultraviolet radiation, infrared radiation or visible glare.
- Wear safety glasses with side shields for protection against flying particles. If you wear regular glasses, you can have prescription safety glasses with side shields made up for you.
- Wear safety glasses with side shields under your welding helmet.
- Wear splash-proof safety goggles when working with chemicals such as solvents or acids. If you wear regular glasses, there are goggles designed to fit over them.
- Wear shaded goggles designed specifically for cutting torches. Use shaded lenses #3 for brazing and #5 for oxygen/acetylene tasks.
- Attach a shaded filter plate to your welding helmet. The shade you need depends on the type of welding, size of the electrode and the amount of electrical current you are using. If you are not sure about the correct shade, check with your supervisor.
- Wear face shields when using chemicals, grinding, chipping, wire brushing, etc.
- Always wear the appropriate safety glasses or goggles with the face shield. The shield by itself is not made to protect your eyes.

Eye Injury Hazards

Eye injuries are more common in the mechanical trade than in any other. Common eye injuries are scratches to the sclera (white of the eye), abrasions and lacerations to the cornea and contusions of the iris, lens, retina, or optic nerve from the force of a blunt object. Others include scarring of the cornea from chemical burns and inflammation of the cornea from ultraviolet radiation (welder's flash).

- One of the two most important eye injury prevention techniques is to use safety eyewear whenever there is potential for exposure to an eye hazard. The other is to choose the most appropriate type of safety eyewear for the job at hand. Always ensure that the safety eyewear you plan to use is designed to protect you from the specific eye hazards you will face.
- For protection against impact from flying particles generated by grinding, chipping, drilling, overhead work, etc., use safety glasses that are shaped to protect the eye from top to bottom and sides, as well as from the front. Impact-resistant safety goggles are another option for impact protection.
- For protection against chemical eye hazards such as acids and caustics, use splash-proof chemical goggles.
- When using a cutting torch, wear shaded goggles with #5 shaded lenses. Make sure the goggles are specifically designed for protection against the cutting torch flame, sparks, and flying particles.
- When welding, attach a shaded filter to your helmet. The shaded lens you will need depends on the type of welding you will be doing. The shade of lens needed for electric arc welding is based on the type of welding you will be performing, size of electrode you will be using and the amount of electrical current being generated. You will need #10, #12, or #14 shaded lenses.
- The lens you will need for gas metal arc welding is based only on the arc current being generated. You will need #11, #12, or #14 shaded lenses.
- Whenever possible, use a flame-resistant screen around your welding area. The screen will help protect the eyes of other workers in the area.

Falls from Edges

An edge is any elevated surface where the end of the surface leads to a drop off to a lower elevation. For example, when a floor is being installed, where the floor stops is considered an edge until the floor installation has been completed. When working on edges, protect yourself from falls by using guardrails, personal fall arrest systems or safety nets.

- When guardrails are used, build them to withstand 200 pounds in any outward or downward direction applied within 2 inches of the top edge at any point.
- When personal fall arrest systems are used, be sure the system will arrest a fall before there is contact with a surface or a structure below
- Full body harnesses and double locking snap hooks provide the best protection on personal fall arrest systems.
- When nets are used, make sure they are high enough to prevent a falling worker from contacting the surface or any object below. Keep the nets clear of construction debris at all times.
- Remember to extend nets outward from the outermost projection of the work surface as follows:
 - ✓ For work performed up to 5 feet above the surface of the net, it should extend out 8 feet;
 - ✓ For work performed from 5 to 10 feet above the surface of the net, it should extend out 10 feet; and
 - ✓ For work performed over 10 feet above the surface of the net, it should extend out 13 feet.

Falls from Scaffolds

All falls from scaffolds can be prevented as long as a few basic concepts are followed while working with scaffolds.

- Inspect the scaffolds before you start to work on them. If any part looks worn or damaged, take them out of service and replace them immediately.
- Make sure the access ladder and guardrails are secure in place.
- Be sure all work areas are fully planked.
- If the scaffold does not look level and plumb, stay off it and report to your supervisor.
- When working 10 feet or more above a lower level, use a guard rail system for fall protection.
- When access ladders are not a permanent part of the scaffold, make sure portable access ladders extend at least three feet above the platform and secured on a level and solid base to prevent them from slipping.
- Eliminate trip hazards by keeping scaffold work platforms clear of debris and unnecessary materials, tools and equipment.
- Remove all potential slip hazards (such as mud, grease, oil, ice, snow, etc.) on platforms and walkways.
- After you are safely on the work platform, pull the items you need up by rope and bucket or have someone hand them to you if possible. Avoid carrying tools, materials and equipment by hand when climbing aboard the scaffold.

Ground Faults

- Ground-fault Circuit Interrupters (GFCIs) can protect workers from most electrical hazards.
- If a technician is standing on a wet or damp floor using a power tool with a damaged cord and comes into contact with a hot or neutral wire, he or she will become the easiest path to ground. The current will flow through the technician to ground.
- GFCI prevents some electrocutions by detecting a difference in the amount of current flowing between the source of the electricity and the tool. If there is even a slight difference, it automatically shuts off the circuit.
- When a difference in current of 5 milliamps is detected, the GFCI trips the circuit in as little as $1/40$ of a second.
- Most power tool receptacles are designed to trip at around 15 amps. However, death from electrical shock can occur for most people at between 70 to 100 milliamps.
- Inspect GFCI-protected circuits regularly because, like any mechanical device, they could fail.

Hand Protection

Hand injuries occur every day. Some are severe, while others are minor, but they do occur frequently. Workers need injury-free hands to do their jobs as effectively as possible, so protect your hands from the obvious hazards.

- The obvious hazards include:
 - Pinch points where hands or fingers get pinched between materials or equipment;
 - Sharp or jagged edges on materials;
 - Getting rings or bracelets caught in tools, materials or equipment;
 - Unguarded tools and machines;
 - Chemical burn and frostbite.
- Stay alert to avoid the pinch point hazards. Think about what you are doing and what will happen next.
- Inspect materials before you move them. Wear leather gloves when handling objects with sharp or jagged edges or when you are exposed to hot metal or sparks. Always wear welding gloves when welding.
- Take off all rings and bracelets before you start work.
- Check for guards on tools and machines that are supposed to have them. If any tool or machine is missing a guard or has a damaged or otherwise inoperable guard, do not use it.
- When working with acids, solvents or other chemicals, use neoprene gloves. Use general-purpose latex gloves for work with detergents and mastics. Check the label or Material Safety Data Sheet (MSDS) if you are not sure what type of glove to use.
- Wear gloves when it's cold and do not touch frozen metal with your bare hands. If your fingers get so cold they hurt, stop work and warm them slowly.

Hard Hats

To protect yourself from head injuries, always wear your hard hat. Hard hats are designed to protect workers from falling objects and other potential sources of head injuries, including electrical hazards.

- Falling objects include tools, debris and materials. Objects may fall from a lift, scaffold, floor opening or any other elevated work area. Other potential sources of head injury include being hit by materials being carried by other workers, walking into stationary objects like pipe, duct work, or contacting sources of electricity with our heads.
- Hard hats are designed to absorb the force of falling objects. The force is distributed throughout the head, neck, spine and shoulders and not concentrated in one spot as it would be without a hard hat.
- Do not turn your hard hat around backwards like a baseball catcher because the bill in the front is designed to deflect falling objects away from your eyes and face. It also helps keep the sun out of your eyes and rain off of your face.
- Always inspect your hard hat before you wear it. If there are any defects whatsoever, discard the hat and get a new one.
- Never drill holes in your hard hat to let heat escape. Even a single hole will weaken it.

Heavy Construction Equipment

Heavy equipment on construction sites can be deadly because it is difficult for the operators to see and hear everything that is going on around them.

- Communicate with the operator by hand signals or portable radios. If necessary, use a coworker to exchange signals with the operator.
- Be sure that the operator acknowledges your presence before you begin working.
- While working, be conscious of the equipment around you.
- Think ahead about potential hazards like swinging booms, buckets and materials rigging.
- Ask operator to place forks and heavy equipment buckets firmly on the ground before you start to load or unload them.
- Always stay out from under crane, forklift and bucket loads.
- Train yourself not to get desensitized to the sounds made by heavy equipment. Always be conscious of the potential heavy equipment hazards around you and avoid them.

Hypothermia and Frostbite

As installers, we are often exposed to cold conditions, especially during the winter months. There are two potential hazards associated with cold conditions. They are hypothermia and frostbite.

- The environment does not have to be extremely cold for workers to suffer from hypothermia. Hypothermia results from the loss of body heat. It can occur even when temperatures are well above freezing. Symptoms of hypothermia include shivering, apathy, loss of consciousness, decreased pulse rate and decreased breathing rate. Death can occur, as well. Protect yourself from hypothermia by dressing properly. Whenever you will be exposed to the cold for any period of time, wear warm clothes and pay attention to your body.
- Remember that most body heat escapes from the head, underarms, and groin area. Block the heat from escaping in these areas and dress in layers so you can remove some clothes when you get hot and put them back on when you start to get cold. If you start to shiver uncontrollably, get out of the cold. Warm back up and then return to work.
- If a coworker shows signs of hypothermia, immediately call for emergency medical services. Get the victim out of the cold and warm his or her body quickly.

Frostbite occurs in freezing weather. The symptoms of frostbite are slightly flushed skin (first sign), white or grayish yellow skin and, finally, bluish gray skin.

- To protect yourself from frostbite, keep your ears, nose, cheeks, chin, fingers and toes covered with warm clothing when exposed to freezing temperatures. Anytime a body part gets so cold that it starts to hurt, get out of the cold. Get warm and then get back to work.
- If you or a coworker shows signs of frostbite, get to a warm place. Place the frozen body part in warm water (not hot). Call a health care provider.

Improper Handling of Materials

Improper manual handling of materials is a leading cause of nonfatal injuries for workers. Workers can eliminate these injuries by following a few simple safety concepts.

- If materials must be moved by hand, make an assessment as to how heavy and bulky they are. If you can't handle them easily by yourself, get help from one or more coworkers.
- When lifting materials, always use proper lifting techniques. Keep the object as close to your body as possible. Keep the natural curves in your back by keeping your butt down and your head up. Lift with your legs and avoid twisting your back while you lift and carry the materials.
- Be aware of situations where your hands could get pinched or crushed between materials.
- Be aware of sharp edges. Protect your hands by wearing leather gloves.
- Watch carefully for hazards that could make you slip, trip, or fall while moving materials. Remove the hazards or carefully go around them.
- Wear steel toed boots or shoes if heavy materials could roll or be dropped onto your feet.

Improper Lifting Techniques

Most back injuries that occur while performing installs are from improper lifting techniques. By following a few simple steps, you can protect yourself from back injuries.

- Many back injuries can be prevented by stretching the back muscles before you begin work. This is particularly true if you have to lift heavy objects during the day. Remember to re-stretch following lunch or long break periods. Suggested stretching exercises include:
 - ✓ **Stretching upper back** – Stand erect with your hands in front of your thighs and palms facing your body. Lift your hands towards your chin while exhaling. Keep elbows pointed out. Hold the position for a moment and slowly lower your hands. Do 2 sets of 12 with a minute rest in between sets.
 - ✓ **Stretching middle back** – Stand erect and raise your shoulders toward your ears. Hold the position for a moment and slowly lower your shoulders. Do 2 sets of 12 with a minute rest in between sets.
 - ✓ **Stretching lower back** – Get on your hands and knees and allow your back to sag. Arch your back upward like a cat and bend your head forward. Hold the position for a moment and slowly return to the starting position. Do 2 sets of 20 with a minute rest between sets.
- Before moving any materials or equipment, assess their weight as best you can. If there is any question in your mind about your ability to easily move them, don't do it alone. Get help from a coworker.
- When preparing to lift an object, whether you are by yourself or getting help from a coworker, follow these steps:
 - Get a firm grip on the object;
 - Get your body as close to the object as possible;
 - Keep the natural curves in your back by keeping your butt down and head up
 - Lift with your legs.
- Once you have the object up in the air be sure not to twist your back. Move your whole body and keep the natural curves in your back.

No Grounding

Electrocutions are a leading cause of fatalities in our industry. Many of them occur because electric power tools and equipment are not properly grounded.

- Electricity always attempts to travel to the ground, taking the path of least resistance and traveling at the speed of light (186,000 miles per second).
- When working with electric power tools and equipment, you can ensure that the current has a safe, easy, path to the ground. If you don't, the easiest path to the ground may be through your body, causing severe injuries or death.
- Inspect the plug each time you use equipment. If the tool or equipment has a two-prong plug, it is probably double insulated. If there is no writing, look for the square inside the square symbol. Either of these techniques assures the user that the tool is double insulated. If you are not sure don't use the tool. Report to your supervisor immediately.
- If the tool or equipment has a three-prong plug and one of the prongs is removed, do not use it. Take it out of service immediately and ensure that it stays out of service until the plug is replaced by someone qualified to do it properly.
- When using a portable generator, ground it properly before you start work.
- Always use GFCIs for added protection against ground faults, especially in wet or damp environments.

Personal Fall Protection Systems

When workers are faced with fall hazards, it is much more comfortable and efficient to use guardrails or hole covers for fall protection than to use personal protective equipment. However, in some situations the preferred fall protection systems are simply not feasible.

- If you must work where you will be exposed to a fall of four feet or more when performing repairs or 6 feet or more when performing new installs, you must be protected from falling. When a preferred fall protection system is not feasible, use a personal fall arrest system or a positioning device system.

Personal Fall Arrest Systems

Personal fall arrest systems consist of a full body harness, lanyard, connectors such as D-rings, and snap hooks and anchorage point.

- Every part of the system you use should be inspected each time before you use it. If any parts are worn or damaged, do not use them. Replace them with new parts that are designed specifically to be used with other system parts.
- Never use any part of a system that has been used to arrest a fall until a competent person inspects the entire system and authorizes its use.
- The system should be rigged to ensure that the user never free falls more than six feet and stops falling before any part of his or her body can make contact with an object or the surface below.

Poor Housekeeping

Poor housekeeping on the job site is a frequent cause of workplace accident and worker injuries. These types of accidents can easily be prevented by keeping the workplace clean. Good housekeeping makes jobs more efficient and safe. Anything left lying around can become a slipping or tripping hazard.

- Keep all of the materials stored on the job site in a neat and orderly way.
- Clean up scraps, debris and trash as the work progresses.
- Focus on keeping walkways, ramps, ladder platform, scaffolds and stairways free from excess materials, scrap and debris.
- Put tools away in your van or truck as you finish with them.
- Take special care when using hoses and power cords in heavy traffic areas.
- Keep mud and other slick substances off walkways, ramps, ladders, platforms, scaffolds, and stairways.
- If you see slippery surfaces while you are working, clean them up with an absorbent material.
- Throw away oily rags and other flammable materials in approved storage containers.
- Remember that a clean job site is always a much safer place to work!

Struck by Equipment

Another hazard to installers/workers is the presence of construction equipment. It is easy to become desensitized to equipment backup alarms. Make a conscious effort to listen for back up alarms.

- Make sure the equipment operators in your area know you are there and be sure they can see you.
- If you have to be out of the field of vision of an operator for any period of time, make sure you communicate with the operator clearly before you re-enter his or her line of vision.
- Be especially aware of equipment being used by workers who may not know you are there.
- If there is equipment operating without backup alarms, let the operator and your supervisor know immediately.
- Be aware of operators trying to position equipment in awkward places without someone to guide them.
- Be careful about wearing hooded garments or other clothes that may obstruct your view.
- Make sure that the hearing protection you choose does not completely block out the sound of horns, backup alarms or equipment engines.

Uncontrolled Sources of Energy (Lockout/Tagout)

Unprotected sources of stored energy can be very hazardous to workers. An example of stored energy that may be encountered includes:

- Electrical (such as panel boxes);
 - Hydraulic (such as aerial lift);
 - Pneumatic (such as an air compressor);
 - Thermal (such as steam lines).
- Workers can be protected from these hazards if the source of energy is locked out and tagged out. Lockout means that the source of energy can't be turned on because a locking device has been placed on the switch, lever, valve, etc. Tagout means there is a warning tag attached to the energy source controls to stop others from activating the source of energy.

If a technician has to perform maintenance or repair on any process with stored energy, it should be locked out or tagged out before work begins. Only qualified workers should engage in the lockout/tagout process.

- Electricity should be locked out or tagged out at the panel box.
- Steam, hydraulic and air-line systems should be shut off and bled out. Otherwise even when the valves are in the off position, there is still hazardous energy stored in the pipes. The valves should be locked out or tagged out.
- Only the person who locked out or tagged out a source of energy should remove the lock or tag.

Alcohol or Drugs

Being under the influence of alcohol or drugs temporarily changes people's behavior. The changes are both psychological and physical changes. These changes cause individuals to do things that they wouldn't ordinarily do or make them forget to do the things they should do. These individuals are much more likely to be involved in a job site accident.

- The psychological and physical changes that take place while under the influence include the following:
 - Change in the way you ordinarily think.
 - Difficulty in concentrating on what you are doing.
 - Losing your ability to make good judgments.
 - Slowing of reflexes.
 - Loss of depth perception.
 - Change in sleep patterns so you are unlikely to get the sleep you need.
- Remember that you can still be under the influence for many hours after taking a substance. For example, if you drink heavily on a work night, you will probably still be under the influence of alcohol when you start work the next morning.
- How long you are impaired depends on what you are using, the amount you use, your body weight and what other substances you have in your body.
- Some over-the-counter and prescription drugs can cause severe impairment when mixed with alcohol. It may take several hours or more before the effects wear off.

2020 Calendar Dates at a Glance

Monday – Friday
9am – 3:30pm
30 min lunch
11 weeks (320 clock hours required)

Cohorts I

02/05/2020 – 04/20/2020

| | |
|-------------|-------------------------------|
| February 5 | First Day of Class |
| February 19 | President's Day School Closed |
| March 30 | Good Friday School Closed |
| April 20 | Last Day of Class |
| April 24 | Exams |
| May 3 | Graduation |

Cohorts II

05/21/2020 – 08/06/2020

| | |
|-----------|---------------------------------------|
| May 21 | First Day of Class |
| May 28 | Memorial Day School Closed |
| July 4 | Independence Day School Closed |
| August 6 | Last Day of Class |
| August 8 | Exams |
| August 16 | Graduation |

Cohorts III

09/04/2020 – 11/16/2020

| | |
|-------------|---------------------------|
| September 4 | First Day of Class |
| November 16 | Last Day of Class |
| November 20 | Exams |
| November 29 | Graduation |

POWER52 ENERGY PROFESSIONAL

Program Outline

| Textbook: POWER52 ENERGY PROFESSIONAL TRAINEE GUIDE / 1ST EDITION / PUBLISHED BY: PEARSONS / PUBLISHED JAN-2017 | | | | | | |
|--|---|---|-------------------------|------------------|------------|--------------------|
| Book Module # | Module ID # | Module Name | Performance Test | Classroom | Lab | Clock Hours |
| Title: | Life Skills (Presented by Living Classrooms) | | | | | |
| Prerequisite: | N/A | | | | | |
| 1 | 00000-01 | Self Awareness | No | 4 | 0 | 4 |
| 2 | 00000-02 | Etiquette | No | 4 | 0 | 4 |
| 3 | 00000-03 | Communication Cues | No | 3 | 0 | 3 |
| 4 | 00000-04 | Conflict Resolution | No | 2 | 0 | 2 |
| 5 | 00000-05 | Digital Education | No | 2 | 0 | 2 |
| 6 | 00000-06 | Financial Literacy | No | 2 | 0 | 2 |
| 7 | 00000-07 | Getting the Job | No | 1.5 | 0 | 1.5 |
| 8 | 00000-08 | Keeping the Job | No | 1.5 | 0 | 1.5 |
| Total Hours: | | | | 20 | 0 | 20 |
| Title: | OSHA-10 (CAREER SAFE) | | | | | |
| Prerequisite: | N/A | | | | | |
| 1 | 10-0001 | Introduction to OSHA (Part 1) | No | 1 | 0 | 1 |
| 2 | 10-0002 | Introduction to OSHA (Part 2) | No | 1 | 0 | 1 |
| 3 | 10-0003 | StartSafe. StaySafe.® | No | 1 | 0 | 1 |
| 4 | 10-0004 | Materials Handling | No | 1 | 0 | 1 |
| 5 | 10-0005 | Hand and Power Tools | No | 1 | 0 | 1 |
| 6 | 10-0006 | Excavations | No | 1 | 0 | 1 |
| 7 | 10-0007 | Health Hazards in Construction | No | 1.5 | 0 | 1.5 |
| 8 | 10-0008 | Personal Protective Equipment | No | 1 | 0 | 1 |
| 9 | 10-0009 | Fall Hazards (Part 1) | No | 1.5 | 0 | 1.5 |
| 10 | 10-0010 | Fall Hazards (Part 2) | No | 1.5 | 0 | 1.5 |
| 11 | 10-0011 | Struck-By Hazards | No | 1 | 0 | 1 |
| 12 | 10-0012 | Caught-In or Between | No | 1 | 0 | 1 |
| 13 | 10-0013 | Electrocution Hazards | No | 1.5 | 0 | 1.5 |
| Total Hours: | | | | 15 | 0 | 15 |
| Title: | Core Curriculum: Introductory Craft Skills | | | | | |
| Prerequisite: | N/A | | | | | |
| 1 | 00101-15 | Basic Safety (Construction Site Safety Orientation) | Yes | 12.5 | 4 | 16.5 |
| 2 | 00102-15 | Intro to Construction Math | No | 10 | 0 | 10 |
| 3 | 00103-15 | Introduction to Hand Tools | Yes | 10 | 4 | 14 |
| 4 | 00104-15 | Introduction to Power Tools | Yes | 10 | 4 | 14 |
| 5 | 00105-15 | Intro to Construction Drawings | Yes | 10 | 4 | 14 |
| 7 | 00107-15 | Basic Communication Skills | Yes | 7.5 | 4 | 11.5 |
| 8 | 00108-15 | Basic Employability Skills | No | 7.5 | 0 | 7.5 |
| 9 | 00109-15 | Intro to Materials Handling | Yes | 5 | 4 | 9 |
| Total Hours: | | | | 72.5 | 24 | 96.5 |

| | | | | | | |
|--|--|--|---------------------|------------------------------|-----------|------------|
| Title: | Your Role In the Green Environment | | | | | |
| Prerequisite: | Core Curriculum: Introductory Craft Skills | | | | | |
| 1 | 70101-15 | Your Role in the Green Environment LEED v4 | No | 15 | 0 | 15 |
| | | | Total Hours: | 15 | 0 | 15 |
| Title: | Solar Photovoltaic System Installer | | | | | |
| Prerequisite: | Core Curriculum: Introductory Craft Skills | | | | | |
| 1 | 57101-11 | Introduction to Solar Photovoltaics | No | 40 | 0 | 40 |
| 2 | 57102-11 | Site Assessment | Yes | 10 | 4 | 14 |
| 3 | 57103-11 | System Design | Yes | 25 | 6 | 31 |
| 4 | 57104-11 | System Installation and Inspection | Yes | 60 | 12 | 72 |
| 5 | 57105-11 | Maintenance and Troubleshooting | Yes | 10 | 4 | 14 |
| | | | Total Hours: | 145 | 26 | 171 |
| Title: | Intro to Microgrids | | | | | |
| Prerequisite: | Core Curriculum: Introductory Craft Skills | | | | | |
| 1 | 80305-12 | Introduction to Smart Grids | No | 2.5 | 0 | 2.5 |
| | | | Total Hours: | 2.5 | 0 | 2.5 |
| | | | | Total Combined Hours: | | 320 |
| *Written and/or Performance exams will be given at the end of each module. | | | | | | |

LIFE SKILLS

Outline

(20 clock-hours)

Self-Awareness

- Journey to Now
- Mindfulness
- Identifying Personal Barriers
- Navigating Resources
- Learning Style + Study Tips
- Career Assessment
- #Goals

Etiquette

- Phone
- Workplace
- Social Norms/Cues

Communication- Verbal, Written, and Non-Verbal cues

- Hand-Shake 101
- 30-second commercial
- Presentation Skills

Conflict Resolution

- Family & Dating Relationships
- Workplace Relationships
- The Art of Positivity

Digital Education

- Navigating Email
- Navigating Social Media/LinkedIn

Financial Literacy

- Needs vs. Wants
- Budgeting
- Credit 101

Getting the Job

- The Docs: Resume, Cover Letter, References
- Interviewing Skills
- Job Search

Keeping the Job

- Workplace Ethics
- Who's Who in the Workplace
- Common Employer Complaints

Career Prep Outputs:

MD Work Exchange enrollment

Learning/career assessments

VARK (Visual/Aural/Read-Write/Kinesthetic)

Holland Code

Resume

Cover letter

References

LinkedIn account

Professional email address

OSHA-10

Outline

(15 clock-hours)

The OSHA 10-Hour Construction Industry web-based training consists of interactive modules discussing various safety tips and procedures one should follow while working in the workplace.

Modules include:

- Introduction to OSHA (Part 1)
- Introduction to OSHA (Part 2)
- StartSafe. StaySafe.®
- Materials Handling
- Hand and Power Tools
- Excavations
- Health Hazards in Construction
- Personal Protective Equipment
- Fall Hazards (Part 1)
- Fall Hazards (Part 2)
- Struck-By Hazards
- Caught-In or Between
- Electrocution Hazards

Each module contains a brief assessment, which must be successfully completed before the student can move on to the next module. Once all modules have been viewed and the corresponding assessments are passed, there is a comprehensive final assessment. Once the student successfully completes the course a printable certificate is available. The student will also receive their OSHA 10-Hour Construction Industry wallet card by mail 4-6 weeks after completion.

I. Introduction to Osha (Part 1)

This module will serve as an introduction to the OSHA Program, what it stands for, and its purpose.

This module covers:

- Explain the meaning of the term “OSHA,” where it came from, and its purpose
- Identify the four categories of business that fall under OSHA standards
- List the responsibilities of employers
- Identify employee rights and responsibilities
- Locate additional information on OSHA regulations

II. Introduction to Osha (Part 2)

This module will serve as an introduction to the OSHA Program, what it stands for, and its purpose.

This module covers:

- Discuss employer responsibilities under OSHA
- Discuss the use of OSHA Standards
- Explain how OSHA inspections are conducted
- Utilize helpful worker safety and health resources

III. Startsafe. Staysafe®

This module will provide an overview of the “StartSafe. StaySafe.” Philosophy.

This module covers:

- What is CareerSafe?
- What is safety?
- Why safety matters to you
- The “StartSafe. StaySafe.” Philosophy

IV. Materials Handling

This module covers the safety concerns and necessary precautions to be aware of when handling, storing, using and disposing of materials.

This module covers:

- List the main types of injuries that occur during handling, storage, use and disposal of materials
- Name the ways to prevent injuries when performing manual lifting
- Identify ways to eliminate hazards that may lead to injury when using forklifts, cranes or slings to handle materials
- List actions that can reduce or eliminate hazards when storing, using or disposing of materials

V. Hand and Power Tools

This module will cover how to StartSafe and StaySafe while using hand and power tools.

This module covers:

- List the hand and power tool safety rules
- Identify the precautions essential to the safe use of different types of tools
- Name the guarding techniques that apply to hand and power tools

VI. Excavations

The module provides information on the safety concerns and precautions when working in and around excavations.

This module covers:

- Identify the greatest risk present at an excavation site
- Recognize the three methods of protecting employees from cave-ins
- Name three hazards to people working in excavation areas and ways to eliminate them
- Describe the functions of a competent worker at an excavation site

VII. Health Hazards in Construction

This module is designed to help students recognize potential health hazards in their workplace environment.

This module covers:

- List the four types of health hazards on construction sites
- Distinguish between acute and chronic hazard exposure and illnesses
- Describe the characteristics and effects of various chemical hazards
- Describe the characteristics and effects of various physical hazards
- Describe the characteristics and effects of various biological hazards
- Describe the characteristics and effects of various ergonomic hazards

VIII. Personal protective equipment

The purpose of this module is to provide an overview of personal protective equipment (PPE) designed to protect your head, face, eyes, ears, hands, feet, respiratory tract and body from injury and discuss the importance of selecting the PPE that is right for the job you may perform.

This module covers:

- Explain why PPE is important
- List the different types of PPE
- Recognize the situations in which different types of PPE should be used
- Describe how to use the different types of PPE
- List employer responsibilities toward affected employees

IX. Fall Hazards (Part 1)

The module will provide an overview of common fall hazards on construction sites, ways to protect yourself from fall hazards, and actions employers must take to protect workers from fall hazards.

This module covers:

- Understand the importance of preventing falls
- Identify common causes of falls in the workplace
- List the factors that affect the severity of injuries from a fall
- Identify dangerous walking-working surfaces
- Describe methods of fall prevention including guardrails, personal fall arrest systems and safety nets
- Recognize when fall protection is and is not required

X. Fall Hazards (part 2)

This purpose of this training module is to provide an overview of OSHA's guidelines and different protection methods.

This module covers:

- Describe OSHA's regulations that protect workers on elevated surfaces
- List the primary fall protection methods
- Explain how guardrails help prevent falls
- Explain guidelines for using safety nets
- Describe the components of personal fall arrest systems

XI. Struck-by Hazards

The purpose of this module is to provide students with the information that will enable you to recognize common struck-by hazards on construction worksites.

This module covers:

- Identify common struck-by hazards
- Describe types of struck-by hazards
- Protect yourself from struck-by hazards
- Recognize employer requirements to protect workers from struck-by hazards.

XII. Caught-in or Between

The purpose of this module is to provide information that helps students recognize common caught-in or caught-between hazards in your work environment.

This module covers:

- Identify common caught-in and caught-between hazards
- Describe types of caught-in and caught-between hazards
- Protect yourself from caught-in and caught-between hazards
- Recognize employer requirements to protect workers from caught-in or caught-between hazards

XIII. Electrocuting Hazards

This module will provide information that helps students recognize and avoid common electrical hazards in your work environment.

This module covers:

- Describe the types of injuries that can result from contact with electricity
- Identify the warning signs that suggest an electrical hazard exists
- List common electrical hazards found on the job
- Identify methods to protect yourself and others against electrical hazards

Lesson Plans for Module 00101-15

BASIC SAFETY (CONSTRUCTION SITE SAFETY ORIENTATION)

Module One (00101-15) explains the importance of safety in the construction and industrial crafts. Trainees will learn how to identify and follow safe work practices and procedures and how to properly inspect and use safety equipment. Trainees will be able to describe the safety practices associated with elevated work; energy release; and various hazards encountered on job sites. **NOTE:** The successful completion of this module will award a Construction Site Safety Orientation credential.

Objectives

Learning Objective 1

- Describe the importance of safety, the causes of workplace incidents, and the process of hazard recognition and control.
 - a. Define incidents and the significant costs associated with them.
 - b. Identify the common causes of incidents and their related consequences.
 - c. Describe the processes related to hazard recognition and control, including the Hazard Communication (HAZCOM) Standard and the provisions of a Safety Data Sheet (SDS).

Learning Objective 2

- Describe the safe work requirements for elevated work, including fall protection guidelines.
 - a. Identify and describe various fall hazards.
 - b. Identify and describe equipment and methods used in fall prevention and fall arrest.
 - c. Identify and describe the safe use of ladders and stairs.
 - d. Identify and describe the safe use of scaffolds.

Learning Objective 3

- Identify and explain how to avoid struck-by and caught-in-between hazards.
 - a. Identify and explain how to avoid struck-by and caught-in-between hazards.
 - b. Identify and explain how to avoid caught-in and caught-between hazards.

Learning Objective 4

- Identify common energy-related hazards and explain how to avoid them.
 - a. Describe basic job-site electrical safety guidelines.
 - b. Explain the importance of lockout/tagout and describe basic procedures.

Learning Objective 5

- Identify and describe the proper use of personal protective equipment (PPE).
 - a. Identify and describe the basic use of PPE used to protect workers from bodily injury.
 - b. Identify potential respiratory hazards and the basic respirators used to protect workers against those hazards.

Learning Objective 6

- Identify and describe other specific job-site safety hazards.
 - a. Identify various exposure hazards commonly found on job sites.
 - b. Identify hazards associated with environmental extremes.
 - c. Identify hazards associated with hot work.
 - d. Identify fire hazards and describe basic firefighting procedures.
 - e. Identify confined spaces and describe the related safety considerations.

Performance Tasks

Performance Task 1 (Learning Objective 2)

- Properly set up and climb/descend an extension ladder, demonstrating proper three-point contact.

Performance Task 2 (Learning Objective 5)

- Inspect the following PPE items and determine if they are safe to use:
 - Eye protection
 - Hearing protection
 - Hard hat
 - Gloves
 - Fall arrest harnesses, lanyards, and connecting devices
 - Approved footwear

Performance Task 3 (Learning Objective 5)

- Properly don, fit, and remove the following PPE items:
 - Eye protection
 - Hearing protection
 - Hard hat
 - Gloves
 - Fall arrest harness

Performance Task 4 (Learning Objective 4)

- Inspect a typical power cord and GFCI to ensure their serviceability.

Teaching Time: 12.5 Hours

(Five 2.5-Hour Classroom Sessions)

Session time may be adjusted to accommodate your class size, schedule, and teaching style.



Materials Checklist for Module 00101-15, Basic Safety (Construction Site Safety Orientation)

| Equipment and Materials | | | | | |
|---|--|--|--|---|--|
| Personal protective equipment: | | Ground fault circuit interrupter (GFCI) | | Provide both defective and serviceable examples of the following items: | |
| Eye protection | | | | | |
| Work gloves | | | | | |
| High-top safety shoes | | | | | |
| Hearing protection | | | | | |
| Hard hat | | Task safety analysis (TSA) example documents | | Eye protection, such as safety glasses and face shields | |
| | | Job safety analysis (JSA) example documents | | Hearing protection, including ear plugs and ear muffs | |
| Whiteboard/chalkboard | | Carabiners | | Hard hats | |
| Markers/chalk | | Double-locking snap hooks | | Work gloves | |
| Pencils and paper | | Examples of SDS or MSDS | | High-top safety shoes | |
| Core Curriculum PowerPoint® Presentation Slides | | Fall arrest harnesses in various sizes | | | |
| LCD projector and screen | | Extension ladder | | | |
| DVD player | | Lanyards | | | |
| Computer with internet access | | Various types of respirators | | | |
| Copies of the Module Examination and Performance Profile Sheets | | Damaged and undamaged extension cords | | | |
| | | Double-insulated power tool | | | |



Lesson Plans for Module 00102-15

INTRODUCTION TO CONSTRUCTION MATH

Module Two (00102-15) introduces trainees to basic math skills needed in the construction environment. The module reviews whole numbers and fractions; working with decimals; the four primary math operations; reading rulers and tape measures; the Imperial and metric units of measurement; basic geometric figures; and area and volume calculations for two-dimensional and three-dimensional objects.

Objectives

Learning Objective 1

- Identify whole numbers and demonstrate how to work with them mathematically.
 - a. Identify different whole numbers and their place values.
 - b. Demonstrate the ability to add and subtract whole numbers.
 - c. Demonstrate the ability to multiply and divide whole numbers.

Learning Objective 2

- Explain how to work with fractions.
 - a. Define equivalent fractions and show how to find lowest common denominators.
 - b. Describe improper fractions and demonstrate how to change an improper fraction to a mixed number.
 - c. Demonstrate the ability to add and subtract fractions.
 - d. Demonstrate the ability to multiply and divide fractions.

Learning Objective 3

- Describe the decimal system and explain how to work with decimals.
 - a. Describe decimals and their place values.
 - b. Demonstrate the ability to add, subtract, multiply, and divide decimals.
 - c. Demonstrate the ability to convert between decimals, fractions, and percentages.

Learning Objective 4

- Identify various tools used to measure length and show how they are used.
 - a. Identify and demonstrate how to use rulers.
 - b. Identify and demonstrate how to use measuring tapes.

Learning Objective 5

- Identify and convert units of length, weight, volume, and temperature between the imperial and metric systems of measurement.
 - a. Identify and convert units of length measurement between the imperial and metric systems.
 - b. Identify and convert units of weight measurement between the imperial and metric systems.
 - c. Identify and convert units of volume measurement between the imperial and metric systems.
 - d. Identify and convert units of temperature measurement between the imperial and metric systems.

Learning Objective 6

- Identify basic angles and geometric shapes and explain how to calculate their area and volume.
 - a. Identify various types of angles.
 - b. Identify basic geometric shapes and their characteristics.
 - c. Demonstrate the ability to calculate the area of two-dimensional shapes.
 - d. Demonstrate the ability to calculate the volume of three-dimensional shapes.

Performance Tasks

This is a knowledge-based module; there are no performance tasks.

Teaching Time: 10 hours

(Four 2.5-Hour Classroom Sessions)



Materials Checklist for Module 00102-15, Introduction to Construction Math

| Equipment and Materials | | | | |
|---|--|---------------|--|--|
| Personal protective equipment: | | Calculators | | |
| None | | Rulers | | |
| Whiteboard/chalkboard | | Tape measures | | |
| Markers/chalk | | | | |
| Pencils and paper | | | | |
| Core Curriculum PowerPoint® Presentation Slides | | | | |
| DVD player | | | | |
| LCD projector and screen | | | | |
| Computer | | | | |
| Internet access during class (optional) | | | | |
| Copies of the Module Examination | | | | |

To the extent possible, and as required for performance testing, provide a selection of the tools listed for each session; alternatively, photos may be used to teach tool identification.



Lesson Plans for Module 00103-15

INTRODUCTION TO HAND TOOLS

Module Three (00103-15) instructs trainees in the identification, use, and care of hand tools. Developing the knowledge to properly choose and safely use hand tools is an essential part of the construction industry.

Objectives

Learning Objective 1

- Identify and explain how to use various types of hand tools.
 - a. Identify and explain how to use various types of hammers and demolition tools.
 - b. Identify and explain how to use various types of chisels and punches.
 - c. Identify and explain how to use various types of screwdrivers.
 - d. Identify and explain how to use various types of non-adjustable and adjustable wrenches.
 - e. Identify and explain how to use various types of socket and torque wrenches.
 - f. Identify and explain how to use various types of pliers and wire cutters.

Learning Objective 2

- Identify and describe how to use various types of measurement and layout tools.
 - a. Identify and explain how to use rules and other measuring tools.
 - b. Identify and explain how to use various types of levels and layout tools.

Learning Objective 3

- Identify and explain how to use various types of cutting and shaping tools.
 - a. Identify and explain how to use handsaws.
 - b. Identify and explain how to use various types of files and utility knives.

Learning Objective 4

- Identify and explain how to use other common hand tools.
 - a. Identify and explain how to use shovels and picks.
 - b. Identify and explain how to use chain falls and come-alongs.
 - c. Identify and explain how to use various types of clamps.

Performance Tasks

Performance Task 1

(Learning Objectives 1 through 4)

- Visually inspect a minimum of five of the following tools to determine if they are safe to use:
 - Hammer or demolition tool
 - Chisel or punch
 - Screwdriver
 - Adjustable or non-adjustable wrench
 - Socket
 - Torque wrench
 - Pliers
 - Wire cutters
 - Measuring tool
 - Layout tool
 - Level
 - Hand saw
 - File
 - Utility knife
 - Shovel or other earth tool
 - Chain fall or hoist
 - Clamps

Performance Task 2

(Learning Objectives 1 through 4)

- Safely and properly use a minimum of three of the following tools:
 - Hammer or demolition tool
 - Chisel or punch
 - Screwdriver
 - Adjustable or non-adjustable wrench
 - Socket
 - Torque wrench
 - Pliers
 - Wire cutters
 - Measuring tool
 - Layout tool
 - Level
 - File
 - Utility knife
 - Shovel or other earth tool
 - Chain fall or hoist
 - Clamps

Performance Task 3

(Learning Objectives 1 through 4)

- Make a straight, square cut in framing lumber using a crosscut saw.



Materials Checklist for Module 00103-15, Introduction to Hand Tools

| Equipment and Materials | | | |
|---|---|---|--|
| Personal protective equipment: | Old and/or unusual hand tools | Files and rasps | |
| Safety glasses | Hammers and demolition tools | Utility knives | |
| Work gloves | Chisels and punches | Chain fall | |
| Whiteboard/chalkboard | Different types of screwdrivers | Ratcheting chain hoist | |
| Markers/chalk | Levels | Chisels or punches | |
| Pencils and paper | Squares | Screwdrivers | |
| Core Curriculum PowerPoint® Presentation Slides | Shovels, picks, and related earth-working tools | Pliers and wire cutters Measuring tapes and rules | |
| DVD player | Plumb bobs | Come-along | |
| LCD projector and screen | Chalk lines | Various types of clamps | |
| Computer | Hand saws | Hammers or demolition tools | |
| Internet access during class (<i>optional</i>) | Non-adjustable and adjustable wrenches | Socket sets and torque wrenches | |
| Copies of the Module Examination and Performance Profile sheets | Proper footwear as designated by the instructor or training facility provider | Hard hats as required by the instructor, training, provider, or the environment | |
| | Adjustable or non-adjustable wrenches | Appropriate load for vertical lifting | |
| | Socket sets | Torque wrenches | |
| | Pliers | Wire cutters | |
| | Measuring tools | Layout tools | |
| | Files | Utility knives | |
| | Shovels or similar earth tools | Chain falls and hoists | |
| | Clamps | Framing lumber for cutting | |
| | Bolts and nuts | Nails | |
| | Screws | Scrap metal for filing or cutting | |
| | Scrap wire for cutting | Hand saws | |
| | Levels | | |

Lesson Plans for Module 00104-15

INTRODUCTION TO POWER TOOLS

Module Four (00104-15) identifies and describes some of the power tools used by construction workers. The construction of each tool is discussed, along with information regarding the safe usage and typical maintenance requirements of power tools. **NOTE:** Trainees are required to successfully complete Module 00101-15, *Basic Safety (Construction Site Safety Orientation)* before studying this module.

Objectives

Learning Objective 1

- Identify and explain how to use various types of power drills and impact wrenches.
 - a. Identify and explain how to use common power drills and bits.
 - b. Identify and explain how to use a hammer drill.
 - c. Identify and explain how to use pneumatic drills and impact wrenches.

Learning Objective 2

- Identify and explain how to use various types of power saws.
 - a. Identify and explain how to use a circular saw.
 - b. Identify and explain how to use saber and reciprocating saws.
 - c. Identify and explain how to use a portable band saw.
 - d. Identify and explain how to use miter and cutoff saws.

Learning Objective 3

- Identify and explain how to use various grinders and grinder attachments.
 - a. Identify and explain how to use various types of grinders.
 - b. Identify and explain how to use various grinder accessories and attachments.

Learning Objective 4

- Identify and explain how to use miscellaneous power tools.
 - a. Identify and explain how to use pneumatic and powder-actuated fastening tools.
 - b. Identify and explain how to use pavement breakers.
 - c. Identify and explain the uses of hydraulic jacks.

Performance Tasks

Performance Task 1

(Learning Objectives 1 through 4)

- Safely and properly demonstrate the use of three of the following tools:
 - Electric drill
 - Hammer drill or rotary hammer
 - Circular saw
 - Reciprocating saw
 - Portable band saw
 - Miter or cutoff saw
 - Portable or bench grinder
 - Pneumatic nail gun
 - Pavement breaker

Teaching Time: 10 hours

(Four 2.5-Hour Classroom Sessions)

Session time may be adjusted to accommodate your class size, schedule, and teaching style.

Prerequisites

Core Curriculum Modules 00101-15; 00102-15; and 00103-15.



Materials Checklist for Module 00104-15, Introduction to Power Tools

| Equipment and Materials | | | | | |
|---|--|---|--|---|----------------------------|
| Personal protective equipment: | | Hammer drill | | A minimum of three of the following power tools are required to conduct the laboratory: | |
| Safety glasses | | Pneumatic drill | | | |
| Face shields | | Circular saw | | | |
| Work gloves | | Saber saw | | | Pneumatic nail gun |
| Safety shoes | | Reciprocating saw | | | Circular saw with blade(s) |
| Hard hats | | Portable band saw | | | Bench grinder |
| Whiteboard/chalkboard | | Miter and/or cutoff saw | | Pavement breaker | |
| Markers/chalk | | Angle grinder | | Portable band saw with blade(s) | |
| Pencils and paper | | Detail grinder | | | |
| Core Curriculum PowerPoint® Presentation Slides | | Grinding wheel for a bench grinder | | Miter and/or cutoff saw with blade(s) | |
| DVD player | | Bench grinder | | Angle grinder with grinding wheel(s) | |
| LCD projector and screen | | Pneumatic nail gun | | | |
| Computer | | Powder-actuated fastening gun | | Reciprocating saw with blade(s) | |
| Internet access during class (<i>optional</i>) | | One or more types of power drill, with chuck key | | Hammer drill or rotary hammer, with suitable bits | |
| Copies of the Module Examination and Performance Profile sheets | | Pneumatic hose whip check Impact wrench (pneumatic or electric) | | Scrap wood and metal for drilling, sawing, grinding, etc. | |
| | | Pneumatic impact wrench | | | |
| | | Pavement breaker | | One or more types of electric drill, with suitable bits | |
| | | Hydraulic jack | | | |
| | | Samples of fractional, metric, numbered, lettered, and masonry drill bits | | | |



Lesson Plans for Module 00105-15

INTRODUCTION TO CONSTRUCTION DRAWINGS

Module Five (00105-15) provides trainees with the information and skills needed to read and understand construction drawings. This module includes a set of four oversize drawings, which is included as an *Appendix* in the Trainee Guide. The drawings are also available for download from www.nccerirc.com.

Objective

Learning Objective 1

- Identify and describe various types of construction drawings, including their fundamental components and features.
 - a. Identify various types of construction drawings.
 - b. Identify and describe the purpose of the five basic construction drawing components.
 - c. Identify and explain the significance of various drawing elements, such as lines of construction, symbols, and grid lines.
 - d. Identify and explain the use of dimensions and various drawing scales.
 - e. Identify and describe how to use engineer's and architect's scales.

Performance Task

Performance Task 1

(Learning Objective 1)

- Using the floor plan supplied with this module:
 - Locate the wall common to both interview rooms.
 - Determine the overall width of the structure studio.
 - Determine the distance from the outside east wall to the center of the beam in the structure studio.
 - Determine the elevation of the slab.

Teaching Time: 10 hours

(Four 2.5-Hour Classroom Sessions)

Session time may be adjusted to accommodate your class size, schedule, and teaching style.

Prerequisites

Core Curriculum Modules 00101-15; 00102-15; 00103-15; and 00104-15.



Materials Checklist for Module 00105-15, Introduction to Construction Drawings

| Equipment and Materials | | | | |
|---|--|--|--|--|
| Personal protective equipment: | | Calculators | | |
| None | | Architect's scales | | |
| Whiteboard/chalkboard | | Engineer's scales | | |
| Markers/chalk | | Drawing package supplied with the Trainee Guide module | | |
| Pencils and paper | | | | |
| Core Curriculum PowerPoint® Presentation Slides | | Complete drawing package for a typical residence or similar simple structure | | |
| DVD player | | | | |
| LCD projector and screen | | | | |
| Computer | | | | |
| Internet access during class (optional) | | | | |
| Copies of the Module Examination and Performance Profile sheets | | | | |



Lesson Plans for Module 00107-15

BASIC COMMUNICATION SKILLS

Module Seven (00107-15) provides trainees with the information and skills needed to communicate effectively and clearly. Developing good communications skills enables the construction professional to become a confident, reliable asset to their craft.

Objectives

Learning Objective 1

- Describe the communication, listening, and speaking processes and their relationship to job performance.
 - a. Describe the communication process and the importance of listening and speaking skills.
 - b. Describe the listening process and identify good listening skills.
 - c. Describe the speaking process and identify good speaking skills.

Learning Objective 2

- Describe good reading and writing skills and their relationship to job performance.
 - a. Describe the importance of good reading and writing skills.
 - b. Describe job-related reading requirements and identify good reading skills.
 - c. Describe job-related writing requirements and identify good writing skills.

Performance Tasks

Performance Task 1 (Learning Objective 1)

- Perform a given task after listening to oral instructions.

Performance Task 2 (Learning Objective 2)

- Fill out a work-related form provided by your instructor.

Performance Task 3 (Learning Objectives 1 and 2)

- Read and interpret a set of instructions for properly donning a safety harness and then orally instruct another person on how to don the harness.

Teaching Time: 7.5 hours

(Three 2.5-Hour Classroom Sessions)

Session time may be adjusted to accommodate your class size, schedule, and teaching style.

Prerequisites

Core Curriculum Module 00101-15; Module 00102-15; Module 00103-15; Module 00104-15; and Module 00105-15.



Materials Checklist for Module 00107-15, Basic Communication Skills

| Equipment and Materials | | | | | |
|---|--|---|--|--|--|
| Personal protective equipment: | | Copies of Figure 3: Are You A Good Listener? | | | |
| None | | | | | |
| Whiteboard/chalkboard | | Copies of Figure 4: Are You A Good Speaker? | | | |
| Markers/chalk | | | | | |
| <i>Core Curriculum</i> PowerPoint® Presentation Slides | | One or more fall-arrest harnesses | | | |
| Pencils and paper | | One or more copies of the manufacturer's donning instructions for the harness in use | | | |
| DVD player | | | | | |
| LCD projector and screen | | | | | |
| Computer | | Several prepared scripts of instructions to be read by one trainee and executed by another | | | |
| Internet access in class (<i>optional</i>) | | | | | |
| Copies of the Module Examination and Performance Profile sheets | | | | | |

Lesson Plans for Module 00108-15

BASIC EMPLOYABILITY SKILLS

Module Eight (00108-15) provides trainees with guidance related to finding and securing a position in the construction trades. In addition, guidance in the areas of problem-solving and effective interaction with others is offered to help ensure their success in the construction trades.

Objectives

Learning Objective 1

- Describe the opportunities in the construction business and how to enter the construction workforce.
 - a. Describe the construction business and the opportunities offered by the trades.
 - b. Explain how workers can enter the construction workforce.

Learning Objective 2

- Explain the importance of critical thinking and how to solve problems.
 - a. Describe critical thinking and barriers to solving problems.
 - b. Describe how to solve problems using critical thinking.
 - c. Describe problems related to planning and scheduling.

Learning Objective 3

- Explain the importance of social skills and identify ways good social skills are applied in the construction trade.
 - a. Identify good personal and social skills.
 - b. Explain how to resolve conflicts with co-workers and supervisors.
 - c. Explain how to give and receive constructive criticism.
 - d. Identify and describe various social issues of concern in the workplace.
 - e. Describe how to work in a team environment and how to be an effective leader.

Performance Tasks

This is a knowledge-based module; there are no Performance Tasks.

Teaching Time: 7.5 hours

(Three 2.5-Hour Classroom Sessions)

Session time may be adjusted to accommodate your class size, schedule, and teaching style.

Prerequisites

Core Curriculum Modules 00101-15; 00102-15; 00103-15; 00104-15; 00105-15; and 00107-15.



Materials Checklist for Module 00108-15, Basic Employability Skills

| Equipment and Materials | | | | | |
|---|--|---|--|--|--|
| Personal protective equipment: | | <i>Minor Decisions: Major Impact. How to Deal with Real Issues in Project Management, DVD. NCCER. 2009. Upper Saddle River, NJ: Pearson Education, Inc.</i> | | | |
| None | | | | | |
| Whiteboard/chalkboard | | | | | |
| Markers/chalk | | | | | |
| Pencils and paper | | | | | |
| Core Curriculum PowerPoint® Presentation Slides | | | | | |
| DVD player | | | | | |
| Computer | | | | | |
| Copies of the Module Examination | | | | | |



Lesson Plans for Module 00109-15

INTRODUCTION TO MATERIAL HANDLING

Module Nine (00109-15) provides safety guidelines for workers handling materials on the job site. It covers proper procedures and techniques to use when lifting, stacking, transporting, and unloading materials. It also introduces basic motorized and non-motorized material-handling equipment commonly found in the construction environment.

Objectives

Learning Objective 1

- Describe the basic concepts of material handling and common safety precautions.
 - a. Describe the basic concepts of material handling and manual lifting.
 - b. Identify common material-handling safety precautions.
 - c. Identify and describe how to tie knots commonly used in material handling.

Learning Objective 2

- Identify various types of material handling equipment and describe how they are used.
 - a. Identify non-motorized material-handling equipment and describe how they are used.
 - b. Identify motorized material-handling equipment and describe how they are used.

Performance Tasks

Performance Task 1 (Learning Objective 1)

- Demonstrate safe manual lifting techniques.

Performance Task 2 (Learning Objective 1)

- Demonstrate how to tie two of the following common knots:
 - Square
 - Bowline
 - Half hitch
 - Clove hitch

Teaching Time: 5 hours

(Two 2.5-Hour Classroom Sessions)

Session time may be adjusted to accommodate your class size, schedule, and teaching style.

Prerequisites

Core Curriculum Modules 00101-15 through 00105-15; 00107-15; and 00108-15.



Materials Checklist for Module 00109-15, Introduction to Material Handling

| Equipment and Materials | | | | | |
|---|--|--|--|--|--|
| Personal protective equipment: | | Objects for manual lifting | | | |
| Standard eye protection | | Several pairs of rope sections of suitable length and equal diameter for tying knots | | | |
| Work gloves | | | | | |
| Whiteboard/chalkboard | | Common objects (rings, bars, posts, poles, etc.) around which knots can be tied | | | |
| Markers/chalk | | | | | |
| Pencils and paper | | | | | |
| Core Curriculum PowerPoint® Presentation Slides | | | | | |
| DVD player | | | | | |
| LCD projector and screen | | | | | |
| Computer | | | | | |
| Internet access during class (optional) | | | | | |
| Copies of the Module Examination and Performance Profile sheets | | | | | |
| The following items are optional: | | | | | |
| Video resource(s) on proper lifting techniques | | | | | |
| A safety harness and positioning belt with lanyard | | | | | |
| Video resource(s) demonstrating how to tie common knots | | | | | |

To the extent possible, and as required for performance testing, provide a selection of the tools listed for each session; alternatively, photos may be used to teach tool identification.

Lesson Plans for Module 70101-15

YOUR ROLE IN THE GREEN ENVIRONMENT

Module 70101-15 covers the impacts of the built environment on the green environment. It introduces methods to reduce negative environment impacts and explains how to apply the principles of a green building rating system.

Objectives

Learning Objective 1

- Select actions to improve your personal environmental impact at home and work.
 - a. Describe the major challenges buildings cause directly or indirectly on the green environment.
 - b. Identify choices in your personal and work life that impact the green environment.
 - c. Prioritize your actions in terms of which ones matter most for the green environment.

Learning Objective 2

- Identify technologies and practices that reduce environmental impacts of a project over its life cycle.
 - a. Describe the life cycle phases of a building and its impacts on the green environment.
 - b. Identify green site and landscape best practices and describe their pros and cons.
 - c. Identify green water and wastewater best practices and describe their pros and cons.

Learning Objective 2 (continued)

- d. Identify green energy best practices and describe their pros and cons.
- e. Identify green materials and waste best practices and describe their pros and cons.
- f. Identify green indoor environment best practices and describe their pros and cons.
- g. Identify green integrated strategies and describe the pros and cons of those alternatives.

Learning Objective 3

- Explain how craft workers can influence and contribute to a project's Leadership in Energy and Environmental Design (LEED) certification.
 - a. Describe the LEED rating process.
 - b. Identify construction activities and project features that affect a project's LEED rating.
 - c. List kinds of information collected during construction to support LEED documentation.
 - d. Identify common construction pitfalls that affect a project's LEED rating.

Performance Tasks

This is a knowledge-based module; there are no performance tasks.

Teaching Time: 15 hours

(Six 2.5 hour sessions)

Session time may be adjusted to accommodate your class size, schedule, and teaching style.

Prerequisites

None.

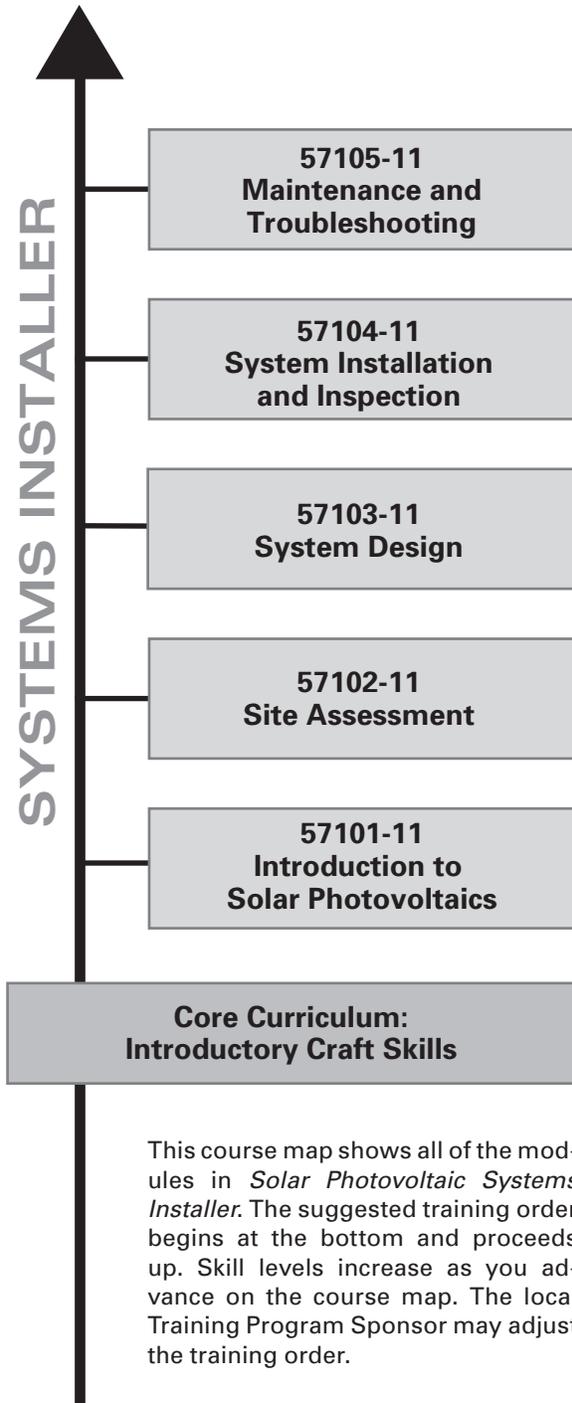


Materials Checklist for Module 70101-15, Your Role in the Green Environment

| Equipment and Materials | | | | | |
|---|------|--|--|--|--|
| Personal protective equipment: | None | | | | |
| None | | | | | |
| Whiteboard/chalkboard | | | | | |
| Markers/chalk | | | | | |
| Pencils and paper | | | | | |
| <i>Your Role in the Green Environment</i> PowerPoint® Presentation Slides | | | | | |
| DVD player | | | | | |
| Computer with internet access | | | | | |
| Copies of the Module Examination | | | | | |
| LCD projector and screen | | | | | |

To the extent possible, and as required for performance testing, provide a selection of the tools listed for each session; alternatively, photos may be used to teach tool identification.

**SOLAR PHOTOVOLTAIC
SYSTEMS INSTALLER**



This course map shows all of the modules in *Solar Photovoltaic Systems Installer*. The suggested training order begins at the bottom and proceeds up. Skill levels increase as you advance on the course map. The local Training Program Sponsor may adjust the training order.

Module Overview

This module is designed for trainees who wish to pursue a career in solar energy. It covers the basic concepts of PV systems and their components. It also explains how PV systems are sized, designed, and installed. Successful completion of this module will help prepare trainees for the North American Board of Certified Energy Practitioners (NABCEP) PV Entry Level Exam.

Prerequisites

Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum*. It is also suggested that the trainee shall have completed the following modules from the Electrical curriculum: *Electrical Level One*, Modules 26101 through 26111; *Electrical Level Two*, Modules 26201, 26205, 26206, and 26208 through 26211; *Electrical Level Three*, Modules 26301 and 26302; and *Electrical Level Four*, Modules 26403 and 26413.

Objectives

Upon completion of this module, the trainee will be able to do the following:

1. Identify photovoltaic (PV) applications and advantages.
2. Identify system components and their functions.
3. Identify safety hazards associated with PV installations.
4. Trace a basic electrical circuit and perform calculations using Ohm's law.
5. List PV system sizing considerations.
6. Identify PV electrical and mechanical system design considerations.
7. Describe the tasks required to complete a site analysis.
8. Identify the effects of the environment on panel output.
9. Describe how to install a simple grid-connected PV system.
10. Explain how to assess system operation and efficiency.
11. Recognize the tasks required when performing PV maintenance and troubleshooting.
12. Identify appropriate codes and standards concerning installation, operation, and maintenance of PV systems and equipment.

Performance Tasks

This is a knowledge-based module; there are no performance tasks.

Materials and Equipment

| | |
|--|---|
| Markers/chalk | Torque wrench |
| Pencils and scratch paper | Sun path calculator |
| Whiteboard/chalkboard | Site survey checklist |
| Solar Photovoltaic Systems Installer PowerPoint® Presentation Slides (ISBN 978-0-13-257135-7) | Angle finder |
| Multimedia projector and screen | Camera |
| Computer | Compass |
| Appropriate personal protective equipment | Calculator |
| Access to various installed PV systems | Tape measure |
| Digital AC/DC meter | Ladder |
| Clamp-on ammeter | Various types of solar panels and mounting system components |
| Pyranometer | Inverter |
| Infrared thermal device | Batteries |

Module Overview

A thorough site assessment is essential to the installation of an efficient system that meets the customer's needs. This module introduces the trainee to the site assessment process for a photovoltaic system.

Objectives

Upon completion of this module, the trainee will be able to do the following:

1. Determine customer needs:
 - Determine electrical load and energy use by review of utility bills, meter readings, measurements, and/or customer interviews.
 - Estimate and/or measure the peak load demand and average daily energy use for all connected loads.
2. Assess any site-specific safety hazards and/or installation considerations.
3. Identify and use the tools and equipment required for conducting site surveys for PV installations.
4. Identify, select, and sketch a suitable location for PV array installation, including proper orientation, sufficient area, adequate solar access, and structural integrity.
5. Select suitable locations for installing inverters, control(s), batteries, and other components.
 - Identify essential loads for battery systems.
 - Identify opportunities for the use of energy-efficient equipment/appliances, conservation, and energy management practices.
6. Acquire and interpret site solar radiation and temperature data to establish performance expectations and use in electrical system calculations.

Prerequisites

Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum* and *Solar Photovoltaic Systems Installer*, Module 57101-11. It is also suggested that the trainee shall have successfully completed the following modules from the Electrical curriculum: *Electrical Level One*, Modules 26101 through 26111; *Electrical Level Two*, Modules 26201, 26205, 26206, and 26208 through 26211; *Electrical Level Three*, Modules 26301 and 26302; and *Electrical Level Four*, Modules 26403 and 26413.

Performance Task

Under the supervision of the instructor, the trainee should be able to do the following:

1. Given the results of a customer interview and the sample house drawing provided, complete a site survey and checklist.

Materials and Equipment

Markers/chalk
Pencils and scratch paper
Whiteboard/chalkboard
Solar Photovoltaic Systems Installer PowerPoint®
Presentation Slides (ISBN 978-0-13-257135-7)
Multimedia projector and screen
Computers with Internet access
Appropriate personal protective equipment
Selection of assessment tools

Sample electric bills
Pictures of sagging or obviously bad roofs,
marginal roofs, and good roofs
Picture with roof and lot dimensions, roof angle,
and number of panels
Several addresses with good aerial views available
on the Internet
Compass
Solar Pathfinder™, if possible

Module Overview

This module describes system design considerations, including array configurations, component selection, and wire sizing. It also covers bonding, grounding, and the selection of overcurrent protection and disconnects.

Prerequisites

Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum* and *Solar Photovoltaic Systems Installer*, Modules 57101-11 and 57102-11. It is also suggested that the trainee shall have successfully completed the following modules from the Electrical curriculum: *Electrical Level One*, Modules 26101 through 26111; *Electrical Level Two*, Modules 26201, 26205, 26206, and 26208 through 26211; *Electrical Level Three*, Modules 26301 and 26302; and *Electrical Level Four*, Modules 26403 and 26413.

Objectives

Upon completion of this module, the trainee will be able to do the following:

1. Identify appropriate system designs and array configurations based on user loads, customer expectations, and site conditions.
2. Determine the size and capacities for major system components based on user load, desired energy production, autonomy requirements, and costs.
3. Determine the PV module layout, orientation, and mounting method for optimum system production and integrity.
4. Determine the ampacity requirement for all components and wiring of the PV system.
5. Select the appropriate conductor types and sizes for each portion of the electrical circuit.
6. Identify the appropriate size, rating, and location of required overcurrent protection and power disconnect devices.
7. Determine the appropriate size, rating, and location for bonding, grounding, and surge suppression.

Performance Task

Under the supervision of the instructor, the trainee should be able to do the following:

1. Given a completed site assessment, design a grid-connected PV system.

Materials and Equipment

Markers/chalk

Pencils and scratch paper

Whiteboard/chalkboard

Solar Photovoltaic Systems Installer PowerPoint®
Presentation Slides (ISBN 978-0-13-257135-7)

Multimedia projector and screen

Computers with Internet access

Appropriate personal protective equipment

Several multimeters

A list of battery requirements including:

Current load

Inverter efficiency

DC system voltage

Days of autonomy

Battery design discharge limit

Several battery catalogs

Several solar panel specification sheets

PV system, working

Photos of several site locations, with their city,
state, and insolation factors

Two or three copies of the *NEC*®

A couple of wire specifications for the trainees to
determine wire sizes

An electrical diagram of a PV system with the
grounding and disconnects removed

Factor values for determining array size

Completed site assessment

Module Examinations*

Performance Profile Sheets*

* Single-module AIG purchases include the printed exam and performance task sheet. If you have purchased the perfect-bound version of this title, download these materials from the IRC using your access code.

Module Overview

This module explains the process of installing a solar photovoltaic (PV) system, inspecting the entire system, and then activating the system.

Prerequisites

Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum* and *Solar Photovoltaic Systems Installer*, Modules 57101-11 through 57103-11. It is also suggested that the trainees shall have successfully completed the following modules from the Electrical curriculum: *Electrical Level One*, Modules 26101 through 26111; *Electrical Level Two*, Modules 26201, 26205, 26206, and 26208 through 26211; *Electrical Level Three*, Modules 26301 and 26302; and *Electrical Level Four*, Modules 26403 and 26413.

Objectives

Upon completion of this module, the trainee will be able to do the following:

1. Review the site assessment report, system design documents, and permits, and inspect the installation site.
2. Perform a job safety analysis (JSA) and deploy safety systems as needed.
3. Use system drawings and manufacturer's instructions to plan the installation and to inventory the project materials and tools needed for the job.
4. Locate structural members and install mounting hardware and raceway.
5. Inspect photovoltaic (PV) system components prior to installation.
6. Install the mechanical parts of the PV modules (panels) and balance-of-system components.
7. Install, label, and terminate electrical wiring and devices in accordance with local and national codes.
8. Activate and test the system to verify overall system operation.

Performance Task

Under the supervision of the instructor, the trainee should be able to do the following:

1. Install and commission a system.

Materials and Equipment

| | |
|--|--|
| Markers/chalk | Stud finder |
| Pencils and scratch paper | Multimeter |
| Whiteboard/chalkboard | Hydrometer |
| <i>Solar Photovoltaic Systems Installer</i> | Set of panel output specifications |
| PowerPoint® Presentation Slides | Bill of Materials for a PV system installation |
| (ISBN 978-0-13-257135-7) | Charge controller and user manual |
| Multimedia projector and screen | Inverter and user manual |
| Computers with Internet access | Combiner and user manual |
| Appropriate personal protective equipment | Disconnect switches |
| Roof anchors | Wiring diagram for solar PV system |
| Harnesses and lanyards | Wire and raceway catalogs |
| Air-filtering respirator | Job safety analysis for each task in an installation |
| ESD protection | Site design plans |
| Sufficient drills, torque wrenches, and tools for panel installation | Section of a roof with shingles |
| | Roofing sealant |

Module Overview

This module introduces the trainee to the components and operation of PV systems and describes how to maintain and troubleshoot them.

Prerequisites

Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum* and *Solar Photovoltaic Systems Installer*, Modules 57101-11 through 57104-11. It is also suggested that the trainees shall have successfully completed the following modules from the Electrical curriculum: *Electrical Level One*, Modules 26101 through 26111; *Electrical Level Two*, Modules 26201, 26205, 26206, and 26208 through 26211; *Electrical Level Three*, Modules 26301 and 26302; and *Electrical Level Four*, Modules 26403 and 26413.

Objectives

Upon completion of this module, the trainee will be able to do the following:

1. Identify the tools and equipment required for maintaining and troubleshooting PV systems.
2. Measure system performance and compare to expected performance.
3. Perform system maintenance as recommended by the PV equipment manufacturer.
4. Perform diagnostic procedures, interpret the results, and implement corrective measures on a malfunctioning system.
5. Verify system functionality, including startup, shutdown, normal operation, and emergency/bypass operation.
6. Compile and maintain records of system operation, performance, and maintenance.

Performance Tasks

Under the supervision of the instructor, the trainee should be able to do the following:

1. Demonstrate typical maintenance procedures on an installed PV system and document the results.
2. Troubleshoot a malfunctioning system and document the results.

Materials and Equipment

Markers/chalk
Pencils and scratch paper
Whiteboard/chalkboard
Solar Photovoltaic Systems Installer PowerPoint®
Presentation Slides (ISBN 978-0-13-257135-7)
Multimedia projector and screen
Computer
Appropriate personal protective equipment
PV system, working
Solar panel, clean and working
Solar panel, working but dirty with dust and debris
Manufacturer's specifications and cleaning instructions
Appropriate soap and cleaning equipment

Solar panel, visibly worn or slightly damaged, and the manufacturer's specifications
Cat III/IV multimeter
Pyranometer
Archimedes and refractive index hydrometers
Water cart, filler gun, and distilled water
Current-limiting battery charger
Noncontact IR thermometer
Batteries, including both sealed and flooded lead acid (FLA)
Sufficient electrolyte
PV system performance evaluation form
PV system maintenance record
Data from an actual PV system check

Module Overview

This module introduces the smart grid concept and describes how it affects power distribution customers. It covers smart grid technology, as well as its applications and benefits.

Objectives

Upon completion of this module, the trainee will be able to do the following:

1. Describe the basic concept of smart grid technology.
2. Describe the basic benefits of the smart grid.

Performance Tasks

This is a knowledge-based module. There are no performance tasks.

Materials and Equipment

Multimedia projector and screen
Power Line Worker Level Three: Distribution
PowerPoint® Presentation Slides
(ISBN 978-0-13-294912-5)
Computer

Whiteboard/chalkboard
Markers/chalk
Pencils and scratch paper
Module Examinations*

* Single-module AIG purchases include the printed exam. If you have purchased the perfect-bound version of this title, download the exam from the IRC using your access code.

Safety Considerations

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. Review safety guidelines associated with working power distribution equipment. Emphasize the importance of proper housekeeping.

Additional Resources

This module presents thorough resources for task training. The following resource material is suggested for further study.