The API 510 Classes consist of "Pre-Course Home Study" materials and "5 days of Classroom" instructor lead training. Registration for the API 510 Training Course must be received 4 weeks prior to the start of the classroom portion of the course. Partial payment ($400.00) for the course must also be received 4 weeks prior to the start of course.

Pre-Course Training modules consist of:
- Daily structured reading plans
- Key points that must be mastered from each paragraph/sub-paragraph
- End of chapter questions
- Flash cards.

Two weeks of the 4 weeks of "Pre-Course Home Study" focuses on learning the API 510 Pressure Vessel Inspection Code book. The reason for focusing two weeks of home study API 510 Code book is because approximately 53% of the API 510 examination comes from the API 510 Code book. During the 4 weeks of "Pre-Course Home Study" the student will gain knowledge from API 510, API 571, API 572, API 576, API 577 and ASME Section V_2011. The classroom training of the API 510 Training Course consist of 4 days of training and 1 day practice exams that resemble the open and closed book exams that will be taken during the API 510 Certification Exam.

Following is some of the content for the Classroom training:

- Calculations (Open and/or Closed Book Exam)
  - Metal Loss (including corrosion averaging)
  - Corrosion-rates
  - Remaining Corrosion Allowance
  - Remaining Life
  - Inspection Intervals
  - Next Inspection

- Joint Efficiencies
  - Weld Joint Categories
  - Type of radiography
  - Joint efficiency by reading Table UW-12
  - Joint efficiency of seamless vessel and heads
  - Joint efficiency for welded pipe and tubing
• Static Head
  o Determine static head/pressure
  o Know difference between Vessel MAWP and Part MAWP
  o Calculate static head pressure on any vessel part
  o Calculate total pressure on any part (i.e. MAWP + Static Head)
  o Calculate max vessel MAWP give vessel parts MAWP and elevations
  o Calculate static head as part of internal pressure calcs, if static head is given

• Internal Pressure
  o Determine required thickness of a Cylindrical shell based on
circumferential stress, given a pressure.
  o Determine required thickness of a Spherical shell based on circumferential
stress, given a pressure.
  o Determine vessel part MAWP for a cylindrical shell based on
circumferential stress, give a metal thickness
  o Determine the required thickness of a head (ellipsoidal &/or
hemispherical), given pressure.
  o Determine vessel part MAWP for a head (ellipsoidal &/or hemispherical),
given a metal thickness.
  o Determine whether a head (ellipsoidal &/or hemispherical) meets Code
requirements give both pressure and metal thickness

• External Pressure
  o Calculate max allowable external pressure
  o Calculate whether a cylindrical shell or tube meets code design for external
pressure, given a wall thickness and a pressure
    ▪ Factors from external pressure charts will be given in wording of
      question. Will not be required to use external pressure charts.

• Pressure Testing
  o Calculate a test pressure compensating for temperature
  o Be familiar with precautions associate with hydrostatic and pneumatic
testing (Brittle Fracture and overpressure, etc)

• Impact Testing
  o Understanding of impact testing requirements and testing procedure
  o Determine MDMT of a material which is exempt from impact testing

• Weld Sized for attachment welds at openings
  o Convert a fillet weld throat dimension to a leg dimension or vice versa
  o Determine the required size of welds at openings
• **Nozzle Reinforcement**
  o Understand key concepts of reinforcement, such as replacement of strength removed and limits of reinforcement
  o Calculate areas of reinforcement or check to ensure that a designed pas is large enough
  o Compensate for corrosion allowances
    ▪ **NOTE:** There will not be any nozzles projecting inside the shell
    ▪ **NOTE:** Weld strength calcs are excluded

• **ASME Section IX**
  o WPS is in compliance with ASME Section VIII and API 510
  o Review will include one WPS and the Supporting PQR
  o Determine all required essential and non-essential variables are addressed
  o Determine if the number and type of mechanical tests are listed on PQR and if results are acceptable
    ▪ Welding procedures could be SMAW, GTAW, GMAW or SAW

• **Practical Knowledge (API 510, API 571, API 572, API 576 and API 577)**
  o Organization and Certification Requirements.
  o Types and Definitions of Maintenance Inspections.
  o Types of Process Corrosion and Deterioration.
  o Modes of Mechanical, Thermal, and High Temperature Deterioration.
  o Pressure Vessel Materials and Fabrication Problems.
  o Welding on Pressure Vessels.
  o Nondestructive Examination (NDE) Methods.
  o Corrosion and Minimum Thickness Evaluation.
  o Estimated Remaining Life.
  o Inspection Interval Determination and Issues Affecting Intervals.
  o Relief Devices.
  o Maintenance Inspection Safety Practices.
  o Inspection Records and Reports.
  o Repairs/Alterations to Pressure Vessels.
  o Rerating Pressure Vessels.
  o Pressure Testing After Repairs, Alterations, or Rerating

• **API 571**
  o Definitions
  o Temper Embrittlement
  o Brittle Fracture
  o Thermal Fatigue
  o Erosion/Erosion-Corrosion
  o Mechanical Failure
  o Atmospheric Corrosion
- Corrosion Under Insulation (CUI)
- Cooling Water Corrosion
- Boiler Water Condensate Corrosion
- Caustic Corrosion
- Sulfidation
- Chloride Stress Corrosion Cracking (Cl-SCC)
- Corrosion Fatigue
- Caustic Stress Corrosion Cracking (Caustic Embrittlement)
- Wet H2S Damage (Blistering/HIC/SOHIC/SCC)
- High Temperature Hydrogen Attack (HTHA)

- Exclusions (not on API 510 Exam)
  - API 510
    - Section 9
    - Appendix E
  - API 572
    - Appendix B
  - API 576
    - All Appendices
  - General Exclusions:
    - Required thickness calculations for wind, earthquake, and other secondary stress loadings;
    - Supplementary design formulas and calculations for non-cylindrical shell components;
    - Most external pressure calculations (except as shown in A.5, above);
    - Nozzle calculations for external loads;
    - Flange calculations;
    - Brazing requirements;
    - Ligament calculations;
    - Stayed flat heads and sizing of stays;
    - Tubesheet calculations (stayed or unstayed) and tube to tubesheet joints and loads;
    - Relief valve sizing;
    - Lifting lug and other structural type calculations;
    - Proof testing requirements;
    - Required inspections for new construction, except as they apply to alterations and repairs;
    - Zick analysis;
    - Integrally forged pressure components;
    - Cryogenic vessels (below -50 f);
    - Dimpled, embossed, jacketed, and non-metallic vessels and assemblies;
- NDE requirements for acoustic emission, eddy current, and motion radiography;
- ASME Sections UF, UB, UNF, UHA, UCI, UCL, UCD, UHT (except UHT-6), ULW, and ULT;
- Code Cases and interpretations;
- Welding process requirements other than shielded metal arc welding (SMAW), gas tungsten arc welding (GTAW),
  gas metal arc welding (GMAW), or submerged arc welding (SAW);
- Requirements for pressure vessels for human occupancy;

Each participant must bring the following electronic code books (pdf files) to the classroom:

- ASME Section V (2013 Edition)
- ASME Section VIII Div 1, (2013 Edition)
- ASME Section IX, (2013 Edition
- API 510 (2014 Edition)
- API 571 (2011 Edition)
- API 572 (2009 Edition)
- API 577 (2013 Edition)

Code books can be purchased from either www.global.ihs.com or www.techstreet.com

Instructions for getting the books from www.global.ihs.com is as follows:

- Click on "Training & Certification",
- Then click on "API ICP Certification Exam Packages",
- Then scroll down until you see the API exam you are interested in (i.e. “API Cert 570 Program SEPT” or “API Cert 570 Program DEC”)

Instructions for getting the books from www.techstreet.com is as follows:

- Click on "Shop by Publisher"
- Click on "API Certification Exam Packs"
- Scroll down until you see the API exam pack you are interested in (i.e "API ICP 570 Exam Pack"