



# *The Fiberglass Institute Presents...*

NCEES Authorized



Registered Continuing  
Education Provider

## FRP 301 – Introduction to Design and Condition Assessment

### Course Schedule and Fees

[www.frpi.org/Seminars.html](http://www.frpi.org/Seminars.html)

**New Inspector  
members get one (1)  
hour free consulting  
support with seminar  
purchase!**

### What are people saying about FRPI seminars?

“The study and case histories of fiberglass failures provided considerable insight and credibility for specs aimed at minimizing probability of future failure.”

“The seminar did not promote a specific manufacturer and was true technology transfer”

“It was like drinking water from a fire hose! Samples, pictures and stories were very helpful learning tools and good reminder the devil is in the details.”



210 Park Avenue, #8; Worcester, MA 01609  
508-380-2232

# Fiberglass Reinforced Plastics Institute, Inc.

## Syllabus

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**Course:** FRP 301 – Introduction to Design and Condition Assessment

**Duration:** Eight (8) contact hours of instruction, with CEU, PDH and TCH credit opportunities.

**Description:** This course provides a hands on detailed look at how fiberglass reinforced plastic (FRP) laminates used in the fabrication of chemical process equipment are designed and manufactured, what their properties are and how they typically failure in service as fabricated structures. This information will help seed your knowledgebase for root cause/affect and cost/value tradeoff centered decision processes. Industry standards and certification programs will be discussed. Both theory and practical experience are blended together with case histories to demonstrate good, risky and poor results that can be expected at design, during fabrication or in the field. Photographs, charts, handouts and demonstrations illustrate concepts, making it easy for beginners and experienced alike to sharpen their understanding of tradeoffs associated with specifying, selling, buying, manufacturing, installing and maintaining FRP equipment.

**Learning Objectives:** After attending this course, participants should be able to:

1. Differentiate and specify good, better and best FRP laminate designs for all applications.
2. Choose industry standards for design, fabrication and inspection purposes.
3. Determine which industry certification programs to use when.
4. Identify all types and compositions of laminates.
5. Assess the design basis for proposed and as built FRP laminates.
6. Describe laminate defects in new and degradation (“corrosion”) in used equipment.
7. Correlate deficiencies in new equipment to failure mechanisms observed in used.
8. Apply concepts to sound decisions that balance cost, risk and public welfare.

**Who Should Attend:**

- FRP Decision Makers
- Inspectors and QA/QC Personnel
- Designers, Engineers and PE’s
- Owner/User and Resident Engineers
- Specification Writers
- Installers, Operators and Maintenance
- Project Managers
- Salespeople
- Purchasing Agents and Buyers
- Those New to Industry

**Prerequisites:** No prior knowledge, special areas of study or experience are required. A general understanding of FRP laminate design, industry standards, manufacturing and inspection may result in establishing a broader and deeper learning experience.

**Recognition:** A completion certificate will be issued to all attendees who participate in the entire program, with eight (8) Professional Development Hours (PDH’s) recorded for Professional Engineers. See Terms and Conditions of Registration for more information pertaining to credit opportunities for Professional Engineers and treatment plant Operators.

**Skill Assessment:** A quiz will be conducted as the last session, with answers discussed within the group as an ungraded learning confirmation exercise. Attendees desiring PDH and TCH credits will be given a program evaluation survey at the end of the course and required to complete it. All attendees are welcome to participate in the survey.

**Instructor:** Gary L. Arthur – FRPI Executive Director and President (see [Biography](#))

# Fiberglass Reinforced Plastics Institute, Inc.

## Biography

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### Gary L. Arthur – Executive Director and President



Gary Arthur is second generation family member in the fiberglass industry, where his father is remembered as one of industry's founders since the mid 1950's. Gary's first shop floor assignment was in June 1973 at age 14. With 24 years professional industry experience, he built a knowledge base from 15 years in manufacturing plus 9 on his own providing fiberglass manufacturers Rep support for 9 principals plus independent consulting services. As family member, officer and owner of small companies, Gary has been directly involved in most aspects related to day to day operations in the fiberglass process equipment business. Involvement in the new equipment business ranged from R&D, marketing, cost estimating and sales through design, engineering, fabrication and QA/QC, whereas construction services and used equipment work covered installation, condition assessment, maintenance and repairs plus alterations on most major brands of equipment.

Gary was partner and owner of Industry's first ASME RTP-1 certified vessel manufacturing operation in 1993 possessing stamp 001, where he is regarded as leader bringing RTP-1 capabilities to market over the past 18 years. He has been performing and managing field services beginning in 1988, with involvement in state tank inspection and OSHA regulations since their initial development in the early 1990's. Gary is also an authorized state tank inspector.



Gary's engineering, manufacturing and quality control vision is complemented by hands-on experience gained through working with 7 materials testing laboratories, touring resin and glass reinforcement production facilities as well as auditing capabilities of a large number of diverse equipment manufacturing operations. Through teaching plus attending, presenting and publishing technical papers at engineering conferences around the US, he has accumulated over 600 hours of continuing fiberglass education. Years of mentoring by Industry's gurus back in the late 80's and early 90's also provided Gary an invaluable foundation for insight associating manufacturing variables with both successful and unsuccessful case histories.

In 2003 Gary founded the Fiberglass Reinforced Plastics Institute, serving as Executive Director and President since inception, where he leads a mission aimed at eliminating mystery and risk associated with fiberglass equipment performance.

With thousands of projects under his belt involving all types of fiberglass equipment, Gary possesses a very broad industry and application background with extensive cradle to grave experience. Equipment applications include tanks, vessels, process piping, air pollution control, stacks and chimney liners. Applications spanned chlorine, dye and pigment, pulp and paper, power, pharmaceutical, food, metal processing plus municipal water treatment industries. Gary Arthur has been acclaimed to be a Fiberglass Industry Expert by many.



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## ***TERMS & CONDITIONS OF COURSE REGISTRATION***

### 1. Course registration and payment.

The convenient method of course registration is online through our website Seminar page registration portal sponsored by EventBrite, with payment by major credit card. Registration and payment by VISA, MasterCard and company or personal check may be made via email, regular mail, UPS, FedEx or other delivery services, with method of payment and registration form enclosed. Registration forms are available on our website Seminar page.

If a membership discount is claimed, then the membership application must be received and fee paid prior to or on the day of course registration. The preferred method of membership payment is online through our website Resource Center page ecommerce portal, with payment by VISA or MasterCard and application emailed simultaneously. Membership payment by VISA, MasterCard and company or personal check may be made via email, regular mail, UPS, FedEx or other delivery services, with method of payment and membership application enclosed. Membership payment by check must be received on or before the 7<sup>th</sup> day preceding course registered for. Membership applications are available on our website Membership page.

Full payment must be made at time of registration in US dollars. Fax registrations cannot be accepted, as we no longer support this antiquated technology. Invoicing for registration and membership is only available for 30 day advanced group registrations, where groups are 5 or more, individual registration forms and membership applications are required and payment terms are due on invoice.

Course registration fees include handouts, morning and afternoon refreshment breaks plus lunch for full day sessions. Due to planning constraints, FRPI regretfully directs those with special assistance and meal needs to make their own arrangements at their expense. Any and all travel, living and miscellaneous expenses incurred beyond the course registration fee by attendees are for their own account.

2. Travel arrangements and hotel accommodations. Anticipating most attendees are within convenient travel distance to course locations, FRPI has not negotiated discounts or room blocks for travel and hotel. Attendees are expected to make their own independent or group travel and living arrangements if needed. Course host hotels are named with links on our website Seminar page.
3. Registration deadline. All online registrations must be received on or before the 2<sup>nd</sup> day preceding the course registered for. All registrations made via email, regular mail, UPS, FedEx or other delivery services must be received on or before the 7<sup>th</sup> day preceding course registered for. Registration is closed the first business day before and morning of the course.
4. Registration confirmation. A confirmation of registration will be sent upon receipt of complete information and payment.
5. Cancellation, transfer or substitution by attendees and refunds. All cancellation notices by attendees must be in writing, with written acknowledgment by FRPI. Refunds of registration fees offered for cancellation are as follows: 100% with 14 days prior notice and 75% with 7 to 13 days prior notice. Attendees may transfer into another course or name a substitute with written notice to FRPI, registration form for substitute if applicable and \$50 rescheduling fee payment received up to 7 days prior to course. Acceptance of transfer or substitution request is contingent upon course availability as is applicable and acknowledgment by FRPI in writing. Transferring may only be done once per attendee per course. No refunds, transferring or substitutions are permitted within 6 days prior or for partial or non-attendance the day of the course. Cancellation within 6 days of course resulting from special circumstances such as acts of god or substantial extraordinary events proven beyond attendee's or their employer's reasonable control may receive special refund, transfer or substitution consideration.

6. Rescheduling, cancellation or instructor changes by FRPI and refunds. FRPI reserves the right to reschedule and cancel courses or change instructors. It is FRPI's intent to provide programs as advertised. However, circumstances that arise beyond FRPI's control may warrant unexpected changes. Registered attendees will receive a 100% registration fee refund for canceled courses and rescheduled courses if the registered attendee cannot transfer or name a substitute. In the very unlikely event an instructor change must be made, no refunds are available. Any losses or damages incurred by registered attendees as a result of FRPI course changes are for the attendee's account.

7. Continuing education credit for Professional Engineers.

FRPI has met the standards and requirements of the Registered Continuing Education Providers Program (RECPP). RECPP is an online service provided by a partnership between the National Council of Examiners for Engineering and Surveying (NCEES) and American Council of Engineering Companies (ACEC). In order to meet RECPP criteria and be listed in their directory, FRPI has been vetted by NCEES to ensure a high level of instructional quality, adherence to high standards and effective practices in professional training.

Credit earned on completion of FRPI programs will be reported to RCEPP. A RCEPP certificate of completion will be issued to each participant desiring credit. The certificate does not include content that may be deemed or construed to be an approval or endorsement by NCEES or RCEPP. RCEPP certificates will only be issued to Professional Engineers who participated in the complete course. Course sign in will be required. No partial credit will be given.

RCEPP and FRPI do not guarantee state board acceptance of FRPI course credit towards state Continuing Professional Competency (CPC) requirements for renewal of Professional Engineer licenses. Professional Engineers desiring state board credit for Professional Development Hours (PDH's) earned through participation in FRPI courses are encouraged to verify state board acceptance of the FRPI program in advance. RCEPP offers a directory of state board contacts at the following website link: <http://www.rcep.net/Licensing-Requirements/Directory-of-State-Boards-1118.htm>.

8. Training contact hours credit for Operators. FRPI will issue a certificate to those Operators who participated in the complete course. Course sign in will be required. No partial credit will be given. Operators of wastewater and water treatment plants desiring state organization (i.e. Department of Environmental Conservation, Department of Environmental Protection) credit for Training Contact Hours (TCH's) earned through participation in FRPI courses are encouraged to verify state acceptance of the FRPI program in advance and must present a photo ID and copy of their operator's license upon signing in at the course if credit is desired. FRPI will make every effort reasonable to assist Operators with getting TCH credit for course completion. FRPI does not guarantee state acceptance of course credit.
9. Dress. Business casual.
10. Equal Opportunity. It is FRPI's policy that no person will be discriminated against or denied course participation due to race, color, religious belief, sex, marital status, national origin, ancestry, sexual orientation or disability.
11. Copying and recording course material. All individual and collective works presented and distributed during the course are copyright protected. Copying material plus audio, still and video recording of any or all course works is prohibited. Recording devices will not be permitted in the room used for the course, including cameras, camcorders and cell phones.
12. Personal property. Attendees are responsible for their own personal items brought to or left at the location where the course is conducted. FRPI cannot assume responsibility for missing or damaged items.
13. Course offers. Content and pricing are subject to change.
14. Tax deduction. Consult with your accountant or financial advisor and be sure to take advantage of tax deductions that may be available for continuing education.
15. Standard Terms and Conditions of Sale. All course sales are subject to FRPI Standard Terms and Conditions of Sale published on the FRPI website, where in case of conflict these conditions of sale are subordinate to the FRPI Terms and Conditions of Registration.