DABJ—Design and Analysis of Bolted Joints

Short Course

Testimonials

Ball Aerospace

"Your presentation skills are excellent with patient attention paid to class questions."

"I enjoyed Tom's interaction with the class. He is easy to relate to and his experience is evident. He answered questions very well."

"Good class materials, good reference. Well presented."

"In general, I think it is a very good idea, and money well spent for the company to give this type of training. It should be mandatory for design engineers."

"The material was well thought out and well presented."

"Tom was well prepared and professional. He answered questions well and allowed the students to interact during the course. Very interesting and effective course."

"Promotes a healthy respect for bolted joints and the engineering behind them."

"Good course, would recommend to all my engineers."

Boeing

"Really good course, more people need to take this."

"Great instructor/speaker, bring him back."

"Great Sarafin course (as usual)."

"All designers should take this course! It presents what analysts have to deal with and why we do what we have to do."

"It was an excellent course with many applicable concepts."

"It would have been nice to have taken this course early in my career."

"Excellent value to my job."

"Best course I have taken."

"This class is well taught. Ideas presented are definitely value added to the company."

DABJ Testimonials

"This course was extremely helpful in understanding the complications associated with fastened joints. It was a good 'eye opener' to potential problems and oversights commonly seen in the workplace. Very educational and thought-provoking."

Bristol Aerospace

"This course exceeded my expectations. I really developed an appreciation for the complexity of designing/analyzing bolted joints. I had wondered how bolted joints could be the topic of a 3-day course, but was surprised that the material was all very interesting and relevant and held my attention."

"I particularly enjoyed the emphasis on understanding the physical phenomena of bolts and joints rather than just presenting equations. It makes the content more memorable and (hopefully) easier to apply."

"Excellent course. Good presentation. I appreciate sharing of the wealth of knowledge."

"Excellent course for the design engineer."

Canadian Space Agency

"One of the most useful courses on joints/analysis/mechanical design I have ever taken."

"Good examples and real life cases."

"As usual, it was a pleasure!"

"Excellent course."

Goodrich

"Taking this course would be tremendously beneficial for anyone working with bolted joints, regardless of their lever of experience. It reinforces the things that you may already be doing well and presents many ideas for improvement."

"Bolted joints which are at the heart of almost all engineering designs are often misunderstood and the necessary analysis missing or incomplete. This course is essential for almost all engineers in the aerospace field. Very few engineers know all the details, nuances, and required calculations to verify their joint designs!"

"All the things every design engineer and stress analyst in the aerospace industry should know (but doesn't) about bolted joints."

"This is an eye-opening course. It will definitely help hone my design skills."

"Great insight to bolted joints analysis. Discussed new topics I haven't thought of in my 30 years of experience."

"Good material and a good teacher with practical experience."

DABJ Testimonials

"Relevant and clear."

"Anyone designing with bolts should take the course."

"This course motivates critical thinking about integrity of bolted joints."

"A whole lotta stuff about bolts."

Jet Propulsion Laboratory

"This class should be a requirement for any engineer, designer or analyst involved in the design, analysis, testing or fabrication of structures."

"Useful for not only engineers, but technical managers, as well."

"Very good course for any person that uses structural fixtures or MGSE flight support equipment."

"Very useful course, especially for those who have not learned any of this formally!"

"Design and Analysis… was a useful course that provided insight, practical experience and guidance on industry standards. A must for practicing engineers."

"Important information on the most common mechanical design feature which is not taught in college."

"This course made bolted joint design more transparent and simpler than it seemed before taking the class."

"This should be a required course for designers."

"I had no idea how much was involved in a bolt and a nut!"

"I feel like so many of the examples were applicable to things I see on a daily basis."

"I wish someone offered this to me in college."

"I am a young engineer with very little actual design work. This class has been very useful! These are the things they don't teach you in college."

"Great informational class with valuable lessons and lays out the foundation for successful design of joints."

"Very good and useful information. This book will be a very good reference in the future."

"Valuable information!!! Wish I had this type of course in college."

"This course is a great supplement…to our standards at JPL."

"Excellent course! I learned a lot and gained a better understanding of the conceptual mechanics of joints and the goals of joints design."

"Excellent course. Learned a lot. Thank you. Would have been very useful for aircraft design."

"This class is very useful to stress engineers, and I would absolutely recommend it. Thank you Tom!"

"There is a good amount of information in this class that I see as extremely important to my job."

DABJ Testimonials

"A great refresher if you already do this work, and a great introduction for new comers."

"Good course. Gave me many things to think about and consider when designing future joints. I will also go back and double check current designs I'm working on."

"Very high quality—extremely useful information."

"Good anecdotes and war stories."

"High-level advice on intelligently designing a joint."

"Tom was incredibly knowledgeable and shared great stories/lessons learned."

"Knowledge of the presenter was excellent! He has amazing track record, experience, and contacts."

"Presenter is a very personable instructor and welcomed real-time complex questions, and was able to explain in a basic manner…a real expert! Thank you, Tom!"

"This class should certainly be offered again at JPL if Tom is available in the future."

"Excellent list of resources for future research."

"Appreciated presentation of analytical theory that was backed up with test data."

"Presenter was able to offer alternate examples and methods of explanation of concepts."

"Presenter kept class interesting by engaging students and having discussions."

"The presenter is very knowledgeable of the material. His experience and work in the field of bolted joints has made the class extremely informative, easy to understand, and has great tips in designing and analysis. He not only touched upon the necessary calculations needed for bolted joints, but also the design considerations that must be taken into account along with the failure modes that may affect the calculations of analysis. This is definitely a much needed course for mechanical engineers."

"I'd recommend this class return to JPL. More of our engineers would really benefit from this info!"

"Great class. Learned a lot of useful information that I will be able to use on a frequent basis."

"Really excellent qualitative description of cause and effect."

"Excellent presentation, great 'general concepts' type of info in addition to detailed analysis."

"Liked the nature of the course. Open forum for discussion. Presented multiple methods used in industry. Examples and equations especially useful."

"I really like the lessons learned and test examples. Really enjoyed the course. I got a lot of good info."

"The intuition-based examples were great. Overall the course was very engaging and useful."

"Appreciate the emphasis of doing each specific case by hand and 'getting out of the black box'."

"Example problems were very useful. Class problems helped reinforce subject matter. Good emphasis on theory. Great discussion of preload."

"Overall good course, good balance between theory and practical application."

DABJ Testimonials

"The presenter had a good sense of the class attentiveness and understanding, and knew when to go back and repeat material. He also was able to refocus the class when we were losing track of the material. This is a very useful class."

"Good class. I would like to take some of the other classes offered by Tom."

"Great class. Should be taken by more mechanical engineers at JPL!"

"Well worth my time. Great presentation and materials. Would definitely be interested in taking more of Tom's classes. Great use of props to further define topic."

Lockheed Martin

"Covers from general overview to highly intellectual/technical materials. Brings up the sophistication in detailed bolted joint analysis and presents simplified approach. Transfers extensive knowledge on the subject matter to students with different levels of experience."

"Course covers all aspects of joint design. Book is a great reference for every engineer."

"it tied together a lot of loose pieces of information that I had informally learned through experience. As a designer, this gave me more insight and increased my understanding of a stress analyst's world."

"This has been the most useful training Lockheed has offered me."

"Require that all ME's take this course."

"Excellent overall. Thank you, Tom! Great use of time."

"Lots of practical examples."

"A great course to remind you to pay attention to the details and practice your basic skills."

"This course should be required as part of an orientation to mechanical design for anyone hoping to perform mechanical design."

"This is a fine class. Does a wonderful job of combining bolt joint data into one location."

"This course was very informative. I've analyzed bolted joints before, but after taking this class I realized the analysis could have been performed more efficiently and more accurately."

"Well organized lecture material with excellent teaching and presentation skills. Must take course for all structural and stress engineers."

"This course was excellent! Great detail, good course pace, good sample problems."

"This is an excellent course for both designers and analysts."

"Highly recommended for both analysts and designers."

"Excellent; the level of detail was appropriate and the instructor was knowledgeable and communicated well. This course was a real eye-opener."

DABJ Testimonials

"A great course for young engineers and a great refresher for senior engineers."

"I found this course to be very helpful. The instructor (Tom Sarafin) can take more complicated material and present it in an understandable manner. The student/teacher interaction was excellent. This course will give an individual an excellent foundation in the design and analysis of fastened joints."

"I found the course extremely useful."

"The class problems were priceless—it's so nice to see how the theory applies to the real world."

"Excellent. I wish I'd had it in school or at my first job."

"Very logical sequence. The examples and background stories in addition to theory made the course very effective in relaying info and ensuring understanding of concepts and applications."

"Examples were great, info was logical."

"Excellent information that applies directly to my work."

"Instructor did a good job keeping the class interesting. Used many helpful examples."

"Great course. This course has given me a much better understanding of my mechanism."

"Time well spent."

"Provides good understanding how to analyze bolted joints that I didn't know before."

"Instructor explained important concepts well before going through process."

"Very practical. Well organized."

"Excellent information: very helpful and applicable."

"Very informative and useful course. Of all the courses this year, this one will prove the most helpful."

"Fantastic—I wish I had this class when I started out as an engineer."

"Good. We need this type of training on this program."

"Practical approach to design and preliminary analysis."

"This class would be useful to every mechanical designer or stress analyst at the company. It should be mandatory training."

"Another excellent course!"

"Great course, everyone should take this."

"Excellent course and excellent instructor!"

"The instructor was very knowledgeable and able to clearly explain concepts. The course material is highly valuable for designing and analyzing bolted joints. Anyone who is designing or analyzing such joints should take this course."

DABJ Testimonials

"Introduced lots of concepts needed for good mechanical design that is often overlooked. I can apply this info now."

"Very useful to designers."

"There was a good balance between theory/mechanics and practical application."

"Very useful info. Will directly help my work."

"Very useful knowledge/skills that I hadn't previously known."

"Recommended to every engineer."

"This is a great course. Brought up a lot of good points that we don't get in college."

"I would recommend it to other designers."

"Awesome!! Wish I had this course about 15 yrs ago. Great job, Tom!!"

"Very well structured class, flow of study theory, look at an example, get class participation—really 'ties it all together.' Excellent course!"

"Excellent course. It has been one of the most complete short courses I've taken."

"Very good refresher on analysis. Very useful practice problems on selecting fasteners."

"Excellent!!! Instructor was very good at explaining material. This topic is directly related to job activities."

"I would highly recommend this class to anyone having something to do with bolted joints. The instructor also added greatly to the class materials through both detailed explanations, past experiences and current activities."

"This is a great course and all structural designers/analysts should take it."

"Since I'm a designer, I really enjoyed seeing the stress side of everything. This will make me more aware of stress when creating my designs."

"Highly recommend for those in the mechanical design/analysis group."

"Excellent course, one of the best short courses I've taken!"

"Great course for design and stress employees."

"A 'must have' for design and analysis engineers!"

"Excellent instructor—master of subject with a lot of enthusiasm. Invaluable material and training that I very much needed as a designer. Really liked how many concepts and course materials were illustrated by real-world stories and examples."

"Excellent course! All design and stress engineers at Lockheed Martin should be required to take this course!"

"Immediately applicable, brings you back to real world sanity checks to compare to 'black box' results."

DABJ Testimonials

"Excellent course. Very clear and concise discussions of topics."

"Great course. Very direct. I needed this course years ago."

"Very fresh and current material."

"Knowledgeable instructor with industry experience."

"This is hands-down the best course/training I have taken at Lockheed. Great job!!"

"Thoroughly enjoyable."

"All stress analysts need to take this course."

"All that I learned was very applicable to my job. I'm looking forward to reviewing the material and putting my new knowledge to use."

"All design engineers should take this course in their first 1-2 years of employment—would yield more effective and efficient designs, reduce design/analysis time."

"Very detailed course. Cleared up most of the questions that I couldn't find anywhere else. Threads in shear knockdown, yield effect on gapping, etc."

"The most relevant course I have taken through LM."

"I didn't know too much about how fasteners worked, and now I do."

"Very valuable for design engineers."

"This course is crucial for analysts involved with tension joint analysis."

"Realistic view of how joints and material act in real life. Overall very well done course."

"Tom was a great speaker, very knowledgeable, interesting and engaging. Course material was easy to follow, well prepared and enlightening."

"Wonderful to see so many aspects of subject tied together in one course and package."

"I thought this course was very useful and applicable to my daily work."

"Great summary of bolted joints. Covers both design and analysis aspect so designers and analysts in the classroom get to see into each other's worlds and have an appreciation for the challenges each face."

"Probably the best course I've taken through LM. Excellent pace set by instructor, helps retention of key topics."

"Wonderful course and package tying together subject."

"Tom Sarafin is a great speaker, very knowledgeable, interesting and engaging. Course material was very easy to follow and well prepared."

"Overall, an excellent course giving very practical information for mechanical engineers."

"Very informative. Made me more aware of detailed stress concerns in how fasteners perform."

DABJ Testimonials

"Great course! Every LM mechanical engineer should attend (stress and design)."

"Plenty of real-life examples and stories."

"Excellent course. Structural analysts should be required to take this course and others like it."

"It directly relates to my job and the products we deliver to our customers."

"Presenter was knowledgeable and dynamic. Exercises were directly applicable. Daily review of important points was helpful."

"Excellent course! This should be mandatory for all new design engineers and analysts."

Excellent…thoroughly enjoyed this course!"

"The many topics that were covered…very applicable to my job. Loved the example problems…helpful to cement the knowledge learned."

"Good! This class refreshed my memory of what I learned in college and solidified that knowledge—not to mention the shortcuts he taught, will save a ton of time."

NASA Dryden Flight Research Center

"Excellent course! Excellent instructor!"

"Very good presentation and material. Instructor is very knowledgeable and answers all questions effectively."

"This is probably one of the best short courses I have ever taken."

"Being a non mechanical/structural engineer and having a background mainly in electrical engineering, the class was presented in a way that I could follow along. Easy to pick up on things."

"Great practical course. Provided knowledge/lessons learned that would have taken years to develop via mentoring."

NASA Goddard Space Flight Center

"I liked the fact that you were familiar with practices and problems we do here. Also, I think examples, or stories, from industry are invaluable."

"It's a good course, especially for young stress analysts, to get an appreciation of the way loads are carried in joints and how to analyze them."

"Great course! Mr. Sarafin did an excellent job and obviously understands the material well."

"I think I'll be a lot less dangerous with all of these guidelines to use. Well, at least I'll be a lot more efficient in my designs."

"Excellent. Makes me realize the importance of engineering judgment."

DABJ Testimonials

“Very good, if nothing else, demonstrates bolt analysis is not a mindless process.”

“Thought the course was very useful and easy to follow.”

“Excellent practical information for anyone responsible for designing/analyzing bolted joints on aerospace hardware. Great job overall.”

NASA Johnson Space Center

“Excellent overview. Good mix of general concepts and technical detail. I would encourage everyone in my division to take this class in the future.”

“Excellent material, excellent instructor!”

“The instructor was very impressive on his knowledge of the material. I look forward to attending another of his courses. Great course!”

“Mr. Sarafin presented the course material with an effective and knowledgeable approach. Notes are detailed for easy reference. I enjoyed the class and I think this material will be used to support my current position.”

“Extremely valuable information. Makes job easier by standardizing bolt selection criteria.”

“So much helpful insight to feel confident on what matters for stress analysis.”

“Wonderful course.”

“Excellent material and instructor. Would definitely recommend.”

“Quality was excellent. My estimation of value for mechanical engineers is excellent. My estimation of value for quality engineers is good.”

“Well done.”

“Take it. Tell everyone you know to take it.”

“Excellent instructor. Great lessons learned on failure modes shown from testing. Required background for analysts.”

“It is a good idea to take to understand NASA standards.”

“A fantastic course—one of the most useful short courses I have ever taken.”

“Very useful to all people. Really shows how difficult bolt analysis/design is and how much we underestimate the work required.”

“Excellent. The instructor was very good, knowledgeable and experienced.”

“I would recommend this course be taken by anyone involved in the design/development of spaceflight hardware, even for non-technical management. The course clearly demonstrates many issues/concerns that can affect bolted joint design and analysis, most importantly the shortcomings of analytical approaches that are often favored over testing.”

DABJ Testimonials

"A must course for structural/mechanical engineers and anyone who has ever questioned the assumptions assumed in bolt analysis."

"Effective summary of bolted joints fundamentals invaluable to any mechanical design engineer."

"Any NASA engineer involved in flight hardware development should take this course."

"The instructor was very patient with students and encouraged participation and questions."

"Anyone involved in bolted joint design, analysis or installation should take this course."

"Everyone at NASA should take this course!"

"You need to take it."

"Excellent job of taking difficult subject matter and explaining it to a variety of people with a diverse range of backgrounds and job responsibilities."

"This course was very good in helping me understand potential issues with joints and fasteners and what the important factors are that influence them."

"Mr. Sarafin's teaching skills are excellent, so I think anyone involved with doing the work or just making programmatic decisions based on recommendations from the stress engineers will benefit."

"I found the broad design concepts and ideas helpful. Now I have a better understanding of what is involved in analyzing a bolted joint."

"The course is good for all engineers, whether or not they will actually perform the work. Program engineers will obtain a real appreciation for the difficulties and pitfalls that structural engineers face."

"Very informative. It will teach you or resupport what you know. Take it, it's very worth it."

"Tom has excellent understanding of the subject matter. He also was able to effectively communicate this information to all skill/proficiency/background levels of the people in the class."

"It was much better than my expectations!"

"Excellent instructor! Excellent examples and class problems to force us to think hard about content. Definitely encouraged long term retention. Anyone who has questions about fasteners, NASA/commercial analysis, and preloads should take it, even if they may not be M.E.'s who'll understand it all."

"Take it if you ever deal with anyone who deals with bolted joints."

"Worth sitting through."

"Recommended for all engineers."

"Great discussion of general topics along with specifics on how to meet NASA standards."

"Good for designers and analysts."

DABJ Testimonials

"This a good course to help better one's understanding of fasteners, bolt design requirements of bolts, and fastener/bolt terminology, especially if you were not trained as an engineer but work with this kind of hardware."

"This class would be beneficial in understanding basic concepts/tools used to analyze fastened joints. Would recommend to…folks to aid in understanding fasteners."

"Definitely take (the) course."

"It was worth the time and will definitely help me in my job."

"Very good in helping me understand potential issues with joints and fasteners and what important factors are that influence them, and thought processes, and good practices."

NASA Langley Research Center

"Enjoyed, very insightful."

"Instructor is excellent and knowledgeable."

"Good use of examples—equation problems and visuals of failed hardware. Thank you!"

"Great course."

What I thought was most interesting or useful: "The depth & background in the subject."

"Instructor is very knowledgeable and presentation style was good to keep class interested and participants engaged."

"Very detailed, informative, presentation was well ordered and organized."

"Excellent."

"Thorough coverage of topic. Instructor very knowledgeable. Handbook will be valuable."

"Very knowledgeable. Told real life examples for better understanding."

"Fantastic."

"This class should be mandatory for all new design engineers at NASA…"

"It's the best class I've taken since college."

"Good, broad handling of the topic. Suitable mix of text, tables, and examples."

NASA Marshall Space Flight Center

"Excellent course."

"Very informative. Tom is very interesting! We appreciate the time."

DABJ Testimonials

"Good to do this—refreshes the basics."

"Good teacher. Class is worth taking!"

"The book will make an excellent reference document."

"Interesting listening to examples of problems with joints from past experiences."

"Tom possesses excellent knowledge of the subject and is a good presenter."

"Well-researched, well-designed course."

NASA Wallops Flight Facility

"Good presentation style, humor is always good. Instructor is very knowledgeable."

"Vast amount of knowledge covered."

"(Instructor is) very knowledgeable and open to debate and views."

"Gave great theory on bolted joints."

"I felt the material was presented well. Very good."

"Good balance of theory and application."

"Excellent flow of material, right level of detail, built good understanding of theory."

"Excellent knowledge and presentation style."

"Knowledge: impressive and expansive. Presentation style: engaging."

"Very good knowledge and presentation."

"Very thorough on formulas—very logical approach utilizing "old school" and new to determine set goal."

"The instructor is very knowledgeable in the subject. If I ever was on a project where I wanted an expert advice on a joint, I would look for his advice."

"The course was outstanding"

"Very good instructor. Like the examples from actual tests and related discussions."

"Well done. Suitable and appropriate."

Northrop Grumman Aerospace Systems

"The update course was a good refresher class in addition to highlighting the info about the new standard."

DABJ Testimonials

“Great course, there is always something new to learn even after taking the course twice for the NASA updates.”

“These methods will save you hours of digging through many resources to ultimately find something less useful.”

“Great course to broaden understanding of process and procedures of bolt design and analysis.”

“Well spoken, knowledgeable instructor with many entertaining stories and in-depth explanations for stress and design.”

“Great course on the new standard NASA 5020.”

“This course opens your eyes to the complexity of fastener mechanics and their significance to static design of structural joints.”

“Very useful class overview of all things to consider when analyzing bolted joints. Entertaining class.”

“I believe this course should be a requirement of all designers. There is a good amount of information covered, but very valuable to get the juices flowing in the engineers head and be more mindful of the nuances of bolt and joint design.”

“Highly valuable for anyone dealing with bolted joints.”

“All aerospace engineers should take this class.”

“Good course to have in-depth understanding of bolted joints.”

“All designers should take this course to help their understanding and appreciate their analyst. All stress analysts need to take this course.”

“How good are your bolt joint analysis assumptions? Have you been under-conservative/lucky? Have you been flying heavy/expensive structures? Can you improve your design approach? Take this class and find out just how much!”

“This class is invaluable to all stress analysts to help them understand the design considerations of bolted joints and the analysis tools/methods that are most applicable to that type of structure. This class promotes better design by understanding load paths and promoting more direct load paths and analyzing well understood problems.”

“Course carried so much information beyond just bolted joints. It also gave us insight on how to approach a problem and consider your allowables, where they come from, and how standards are developed.”

“It helped me a lot on how to make a bolted joint more efficient, (to) better predict the potential failure area.”

“Simplified explanations, good thoughtful problems, good discussion, easy going, kept my attention.”

“Good practical tips. All engineers should know this stuff.”

“This is a great course for designers and I would recommend it to anyone in my work group.”

“Great review for someone who’s been out of school for awhile.”

DABJ Testimonials

"I liked all the industry examples and inside knowledge."

"Great course! Lots of lessons learned examples made it that much better."

"Kudos to you for spreading knowledge! Wish you a long and successful career."

"The course was good, well paced, very informative."

"This class has been tremendously helpful in generating confidence in my own analysis technique."

"A great class. I hope to take another of your classes in the future."

"Very thorough. Very useful course. A lot of useful information, and very well presented."

"It is a very good course for working engineers."

"Excellent. I wish I'd had this when I was choosing bolts/inserts 6 months ago."

"Class was enjoyable, instructor has real world experience. I would recommend this course to MGSE designers."

"Loved the whole thing. Class problems were a little humbling and kept it real."

"I was pleasantly surprised to find how high-level this course was. I thought I knew a lot about fastened joints and that I might not find the course useful. (I learned a bunch)."

"The professional's experience shone through."

"Thank you for being an engaging speaker/teacher. I enjoyed the personal anecdotes and lessons learned—these are some of the best ways to learn. Thank you also for the example problems and class problems, as I rely on 'doing' to really understand what is going on."

"I think all stress people at this company should take the course."

"Real world examples were really helpful."

"This course will be valuable for performing preliminary analysis on designs prior to giving it to the stress group. The instructor for this course was also very knowledgeable in the subject matter."

"This would be a good class for managers who don't have the background to help them understand why analysts request testing or changing the design, etc.."

"There was a lot of quality material presented, especially for young engineers who may be a little bit shy in asking."

"This course is invaluable for bolt design and stress analysis engineers. It would also benefit students in engineering school before they graduate."

"I loved this course. It will be very valuable to my everyday work. Real examples that you and others shared with us."

"Class problems related to real world applications and test data."

"Very important to neglected topic—found it extremely valuable. Thank you!"

DABJ Testimonials

"It really opened my eyes as to where allowables come from, good rules of thumb, identifying failure modes."

"The class has given me tools and knowledge to better do my job as an MGSE designer."

"Excellent class, went over many topics used every day in my field. Examples of real life situations were very well incorporated."

"Outstanding course, very thoughtfully presented."

"Tom is a great instructor."

"Very good, practical course."

"I think the course material is extremely applicable."

"This class gives me more confidence when (I) look into analysis of bolt jointed design or existing assemblies."

"Very informative, exposed to concepts/checks that I didn't check for in the past."

"Overall very good class."

"An excellent presenter and an expert in his field."

"Great course! Very applicable information."

"This course will make me more aware of what I do and why I do it. I recommend it to anyone who either knows nothing or thinks they know everything."

Sandia National Labs

"So much information I have never seen before."

"Course provides a nice combination of basic engineering techniques (equations, etc.) with practical/experiential context to allow the student to get the basics and some experience transfer as well."

"This class was full of useful information that I plan to implement in future designs."

"This course provides a great overview of bolt analysis and provides plenty of tools to help analyze designs and joints."

"This course is a great reintroduction to proper engineering of bolted joints."

"It was clear (the) instructor had extensive hands on experience in subject being taught."

Sierra Nevada Corporation

"Prof was very knowledgeable on material."

"I am quite impressed with the amount of updating since 2009."

DABJ Testimonials

"Excellent course!"

"Great course, very informative with new information and good refresher for some things (I) haven't used a lot."

Other organizations

"A fantastic overview of joints and bolts."

"Great course for gaining a better understanding of what it takes to properly design a bolted joint."

"Very useful to better understand the analysis concepts dealing with my design work."

"A very useful course covering analysis techniques and in-depth design considerations for bolted joints."

"This class was very helpful in understanding and evaluating how bolted joints affect design. I learned many techniques that will apply to my designs."

"As a new engineer, it's hard to find all the rules and regulations that a designer or analyst needs to follow. This course brings all that knowledge together and presents it in a manner that is easy to understand and use. Would recommend it to anyone."

"Very interesting course! It made me think more about how we do things and wonder if they are correct or not."

"Very complete."

"Excellent coverage and delivery!"

"This course was excellent. This binder will be at my finger-tips when doing fastener analysis."
"I like the stories! Captivating instructor helps make the class useful!"

"This is a must course for every stress analyst who has been doing this type of analysis in a much different way."

"Great course. Very informative with real world examples."

"You will learn a lot about bolted joints."

"Best class I have ever taken. Learned more than expected."

"Extremely practical for multiple disciplines."

"Excellent course and instructor for analysts and design engineers."

"Great preview and background for NASA-STD-5020."

"Excellent class to learn about the complications of bolted joints, and how to make it manageable and not too much of a science project."

"I wish I had taken the course earlier in my career."

"Excellent course that should be required by management for all analysts."

DABJ Testimonials

"This is an incredibly resourceful introductory course on bolted joint analysis and the new NASA-502o standard."

"There is so much I forgot when I am trying to do my job because of the spread sheets. Now I feel better to check not only my work before test, but also the analysis/design quickly."

"Great course. Stress analysts must take it!"

"Tom adds a lot of personal enthusiasm when he teaches."

"Bolts and SMS classes are the most applicable training I've taken for my job."

"This course is an absolute "must" for all stress analysts. This course is revolutionary for bolted joint analysis."

Email received a month or two after class:

> "Hi Tom,
>
> I took both of Bolted Joints and Structural Test Design and Interpretation courses. They are really practical and tailored for working engineers.
>
> I was working on a mass simulator design and we were preparing for the static proof load test. Just a few days prior to the test, I discovered that a few of the bolted joints didn't have adequate strength to support the required proof load test. By using the knowledge from the bolted joints course, I was able to identify the problem area and modify the design to support the proof load test.
>
> Please keep me informed on all your future courses."