

# **MDSOLIDS: SOFTWARE TO BRIDGE THE GAP BETWEEN LECTURES AND HOMEWORK**

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<http://msumusik.murraystate.edu/mdsolids>

## **Introduction**

For many years, computers and particularly personal computers have offered the promise of a revolution in the way that traditional engineering topics are taught. In some regards, this revolution has occurred. Computer-aided drafting and design (CADD) and sophisticated analysis packages have changed the engineering curriculum, making it possible for students to analyze and design at a level of precision impossible to accomplish with hand-calculations alone. Much of this improvement, however, occurs at the upper-end of the engineering curriculum. At the introductory level, in courses such as mechanics of materials, the impact of computer software on the teaching of fundamental concepts has been less successful. A computer program called MDSolids has been developed with the goal of assisting students in the study of the introductory mechanics of materials course (also called strength of materials or mechanics of deformable solids). MDSolids was conceived as a tool to help students solve and understand homework problems typically used in the mechanics of materials course. The software is versatile, graphic, informative, and very easy-to-use.

Students normally enter the introductory mechanics of materials class with diverse backgrounds and differing levels of understanding pertaining to the prerequisite mechanics courses. After completing the course, students should be able to bring together various skills and concepts to solve engineering problems. Each student learns at his or her own rate, and unfortunately, the pace of lecture topics is sometimes faster than the student finds comfortable. While the more fundamental aspects of the mechanics of materials topics are addressed by professors during lectures, in-class time is limited and professors may opt to use this time to present and explain examples and problems that illustrate more advanced problem-solving analysis and synthesis skills. Concepts and problem-solving skills that should be firmly in place before proceeding to analysis topics are sometimes absent or underdeveloped.

Homework assignments are the primary device used to develop the student's understanding of the mechanics of materials topics. The typical assignment can be somewhat lengthy; therefore, only selected problems can be assigned. Professors may expect (or hope) that their students will work enough extra problems so that the fundamentals are firmly grasped, but students sometimes struggle just to keep up with the homework and exam schedule. To supplement the student's educational development, the self-study potential offered by software would seem to be the ideal

means of filling the gap between the material presented in lectures and the understanding and skills expected in homework and exams.

## **Educational Benefits Unique to Software**

Software can help students study mechanics of materials and develop the necessary problem-solving skills in several ways that are not inherent in lectures or customary assignments.

- **Correct Solution and Intermediate Results:** When learning a new concept, it's very helpful to use the correct solution as a benchmark. Knowing that the problem has been solved correctly gives the student confidence in their problem-solving skills and thereby provides a foundation for more challenging problems. Every textbook provides answers to selected problems for this reason. Software can provide the student with the correct solution for a particular problem, but in addition to the final answer, software can provide intermediate solutions that can be used to confirm the calculations along the way. These intermediate results can be helpful in tracking down faults in the problem-solving approach.
- **What-If Analyses:** Observing a cause-and-effect relationship can be quite helpful to students. For example, a student can develop a sense of the column buckling phenomenon without calculating a single number by assuming various end support conditions and then observing the effects on the buckled shape. This can help students to develop engineering intuition that will help them know what the correct solution should be before they calculate a single number.
- **Availability:** In the evening hours, during weekends, or when working at home (which may be distant from the classroom), students don't have access to professors, graduate assistants, or others who can help them understand the course material. Having a versatile software tool at hand to supplement the textbook and lecture notes can be a big asset.
- **Repetition:** Some people must see or perform more repetitions involving a concept before they begin to fully understand it. Time limits the number of examples that can be presented in lectures, and textbooks can present only a few examples. With software, students can drill themselves, trying various numeric combinations for a particular problem type until they feel confident in their understanding of the concepts.
- **Visualization:** Software can depict deformations or show stress distributions produced in the problem being considered. Visualization of the material's behavior in response to the loads acting on it can help the student to understand the relevant theory and to develop engineering intuition.

## **Current Mechanics of Materials Educational Software**

Most of the current educational software developed for the mechanics of materials course can be grouped into three categories: tutorials, worksheets, and basic analysis packages.

**Tutorials** direct the student through a series of prepared screens, each focused on a specific concept or skill. In this manner, tutorials are like lectures delivered in a different format. Recent tutorials such as the Multimedia Engineering series (1, 2) feature impressive presentation, complete with animation, video clips, and audio files. Despite excellent presentation, however, tutorial products are limited in applicability. The student must follow the sequence of the tutorial presentation in the same way that they would follow along in a lecture. The student must master the concept presented by the tutorial and then apply that concept to the particular problems that they are asked to solve in their homework assignments.

**Worksheets** for equation-solving software such as Mathcad, MATLAB, and TKSolver have also been developed to supplement the mechanics of materials course (3, 4). One drawback of worksheets is that the student must be somewhat familiar with the host software package in order to use the worksheet. In a sense, this disadvantage can also be viewed as an advantage since worksheets encourage the student to develop some command of the equation-solving software, and familiarity with the equation-solving software is a skill that is useful in later engineering courses. However, to the student whose immediate goal is learning the mechanics of materials concepts, the added burden of gaining proficiency with the equation-solving software can be daunting.

**Basic analysis packages** have been included in several widely available mechanics of materials textbooks such as Lardner/Archer (5) and Craig (6). These programs are useful as tools for assisting students in fundamental skills such as plotting shear and bending moment diagrams or performing Mohr's circle calculations. Basic analysis programs may require students to define nodes and elements and to assign section properties and material constants to the elements. Input for these programs has typically been very text-based, often requiring a user's manual to ensure that the proper data and sign conventions are used and to help in interpreting the program output. The novice engineer may feel overwhelmed by the attention to detail needed to set up an analysis model and may have difficulty visualizing and interpreting the resulting tables of numerical output.

All three categories of educational software are generally developed from the professor's point of view, emphasizing lecture topics or permitting the student to perform more advanced calculations. To be successful, educational software should be developed from the student's point of view. Rather than forcing the student to solve a problem posed by the software, the software should solve the problem of interest to the student. To do this, educational software must be:

- versatile in the types of problems that can be solved,
- strongly visual to illustrate the behavior of materials,
- informative in explaining how and why the calculations are performed, and
- intuitive and easy-to-use so that the student is presented with just the right amount of information and analytical power.

## The MDSolids Concept

MDSolids is an educational software package devoted to the introductory mechanics of materials course. The hypothesis of the MDSolids concept is that students are most interested in understanding the specific homework problems assigned by their professors, and that students will use educational software if it helps them with their immediate course concerns. In the process, the software can help to develop problem-solving skills by giving students an intuitive interface that guides them to the important factors affecting various problem types, helps them visualize the nature of internal stresses and deformations, and provides an easy-to-use means of investigating a greater number of problems and variations. Based on this premise, MDSolids was developed with several objectives in mind:

- **Versatility:** MDSolids has routines pertaining to all of the topics taught in a typical mechanics of materials course. These routines are grouped in modules, similar to typical textbook chapters, and the modules can be accessed in any sequence. Eleven modules pertaining to a wide range of common textbook problems are presently available: basic stress and strain, beam-and-strut axial problems, trusses, statically indeterminate axial structures, torsion, determinate beams, section properties, general analysis (of axial, torsion, and beam members), column buckling, and Mohr's circle transformations. Within the modules, each routine solves types of problems typically found in all mechanics of materials textbooks. The scope of MDSolids offers routines to help students at all levels of understanding, from the most fundamental knowledge-, comprehension-, and application-type problems to more complex problems requiring analysis and synthesis.
- **Ease-of-Input:** Ease-of-input is an essential aspect in the MDSolids concept. Solving the mechanics of materials problems is confusing enough for students. To be effective, educational software must not add to the confusion. Ideally, the student should be able to define a problem intuitively and directly from a textbook without the need for a user's manual. Throughout MDSolids, graphic cues are provided to guide users in entering data. The illustrations can be easily adjusted so that the MDSolids input screen looks very similar to the textbook illustration. Various units (e.g., stress units, length units) are available and internal conversion factors are present to ensure dimensional consistency.
- **Visual Communication:** Each MDSolids routine features a picture, sketch, or plot that graphically depicts important aspects of the problem. Sketches are used to show the direction of internal stresses, applied loads, and reaction forces. Plots are given for a number of topics including critical buckling stress, beam deflections, and shaft shearing stress. As the cliché goes, "one picture is worth a thousand words."
- **Correct Solution and Intermediate Results:** MDSolids is an "electronic solutions manual," giving not only the correct solution for a particular problem but also providing intermediate solutions that can be used to confirm the problem-solving approach.
- **Text-based Explanations:** Many of the MDSolids modules provide extra explanations to describe in words how the calculations are performed. These explanations can help students develop the thought processes used in solving mechanics of materials problems. The text explanations are dynamic and context-sensitive, tailored specifically to the particular problem in terms of the values and units entered for the problem. Common mistakes in

equilibrium equations, unit inconsistencies, and equation manipulations become obvious when a student compares hand calculations with the MDSolids explanations.

- **Help Files:** The MDSolids help files contain instructions for using the software, but more importantly, the help files contain theoretical background and practical suggestions for solving various types of problems. The help files also contain a number of worked example problems. These example problems describe how to solve the solid mechanics problem by hand, not through the use of MDSolids. Therefore, MDSolids users can take advantage of the software to solve a problem as well as getting a detailed systematic description of the solution process.

## **Assessing the Effectiveness of MDSolids**

MDSolids has been used by students at Murray State University for three semesters. The software was installed in the departmental student-computing lab and diskettes were given out so that students could install MDSolids on their home computers. Use of the software was encouraged, but the software was not shown or discussed during lectures and no assignments requiring MDSolids were given. Since students were entirely free to choose whether to use the software or not, a statistical assessment of the software effectiveness was not possible. However, students who took advantage of the software did report that they believed the software helped them to better understand the course material. Furthermore, students have reported that they continue to use MDSolids to help them in subsequent courses such as machine design and structural steel design.

## **Impact of MDSolids**

The software was made available free-of-charge to the engineering educational community in January 1998 at the MDSolids website <http://msumusik.mursuky.edu/mdsolids>. In the first months of its availability, over 2000 professors and students from around the world downloaded the software. Professors and students from a number of schools have contacted the author:

### *Schools in the United States*

Alfred University  
Ball State University  
Cameron University  
Century College (Minnesota)  
Clemson University  
Colorado School of Mines  
Columbus State Community College  
Georgia Tech University  
Kansas State University, Salina

Milwaukee School of Engineering  
North Dakota State University  
Oregon Institute of Technology  
Pennsylvania State University,  
Worthington/Scranton  
Pennsylvania State University, Altoona  
Purdue University, Fort Wayne  
Sinclair Community College  
Southern Illinois University, Edwardsville

Texas State Technical College  
University of Texas, Austin  
University of Akron  
University of Colorado, Boulder  
University of Dayton

University of Minnesota  
University of Missouri, Rolla  
University of Wisconsin, Stout  
Vanderbilt University

### *Schools Around the World*

Camosun College, *Canada*  
Lambton College, *Canada*  
Lauder College, *Scotland*  
Niagara College, *Canada*  
Suranaree University of Technology,  
*Thailand*

Tel-Aviv University, *Israel*  
Universidade do Minho, *Portugal*  
University of Patras, *Greece*.  
Victoria University of Technology,  
*Australia*

The response of MDSolids users has been uniformly positive and enthusiastic. (Selected correspondence from MDSolids users has been attached as an appendix.) As demonstrated by the list of schools above, MDSolids has been used in engineering, engineering technology, and community college programs.

## **Conclusions**

MDSolids has proven to be a valuable addition to the mechanics of materials courses at Murray State University, and it is becoming known and being used by professors and students around the world. The software was conceived as a tool to help students to bridge the gap between topics presented in lectures and the application of that theory in solving problems commonly used in mechanics of materials homework assignments. Using MDSolids, students get numerical, visual, and textual results and details pertinent to a wide range of problems. Since MDSolids is so easy-to-use and because it provides ample feedback, students are encouraged to attempt more mechanics problems and to explore what-if variations. Through this extra repetition, students develop engineering intuition and greater confidence in their problem-solving skills. MDSolids has been a successful supplement to help students attain mastery of the knowledge, comprehension, application, analysis, and synthesis levels of the learning process.

## **References**

1. Gramoll, K., Abbanat, R., and Slater, K. (1996). *Multimedia Engineering Statics*. Addison Wesley Interactive, Reading, Mass.
2. Gramoll, K., Abbanat, R., and Slater, K. (1996). *Multimedia Engineering Dynamics*. Addison Wesley Interactive, Reading, Mass.

3. Evensen, T.C. (1997). *Mathcad Supplement* in Gere, J.M. and Timoshenko, S.P. (1997). *Mechanics of Materials, 4<sup>th</sup> ed.*, PWS Publishing Co., Boston, Mass.
4. Turcotte, L.H. and Wilson, H.B. (1998). *Computer Applications in Mechanics of Materials using MATLAB*. Prentice Hall, Upper Saddle River, N.J.
5. Lardner, T.J. and Archer, R.R. (1994). *MECHMAT in Mechanics of Solids: An Introduction*, McGraw Hill, New York, N.Y.
6. Craig, R.R. (1996). *MechSOLID in Mechanics of Materials*, John Wiley & Sons, New York, N.Y.

## Appendix: E-Mail Comments from Users of the MDSolids software

since it was made available over the Internet on January 12, 1998

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Date: Sun, 25 Jan 1998 08:41:02 -0700  
To: tim.philpot@murraystate.edu  
From: "Dr.Tanongsak Bisarnsin" <tanong@sura.sut.ac.th>  
Subject: MDSolids

Dear Tim:

Thanks for your email concerning MDSolids. I checked it out and tried it. I can't tell you how glad and exciting I about your work and the contribution to its technical teaching community.

This trimester I'm teaching Mechanics of Materials I at Suranaree University of Technology in Thailand. You can see how thrilled I'm to have this tool for the class. I can see that at least one-tenth of my students who usually flunk this course will make it!

I will use the program in the class room. (We have the PC and CRT projector in the 300-seat class room.) So it will be used after the actual on paper example is explained. Your MDSolids program will be installed on PCs that students can access across the campus.

Anyway thanks a lot, and I will keep in touch informing you about the classes' progress. My URL (<http://sut2.sut.ac.th/sut2/>).

Best regards,  
Tanong

Dr.Tanong Bisarnsin  
Suranaree University of Technology  
Institute of industrial Technology  
111 University Avenue  
Nakhon Ratchasima 30000, THAILAND

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Date: Tue, 20 Jan 1998 10:15:12 -0800  
From: Mark Rossow <mrossow@siue.edu>  
Organization: Southern Illinois University at Edwardsville  
To: tim.philpot@murraystate.edu  
Subject: MDSolids

Prof. Philpot:

I downloaded a copy of MDSolids. Congratulations on a nicely polished program that looks like many hours of programming went into it.

Congratulations again on your program.

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Mark Rossow, Professor of Civil Engineering Phone: (618) 692-2533  
Campus Box 1800 Fax: (618) 692-2555  
Southern Illinois Univ. at Edwardsville E-mail: mrossow@siue.edu  
Edwardsville, IL 62026-1800 USA

Date: Tue, 27 Jan 1998 07:27:29 -0500  
To: Tim Philpot <tim.philpot@murraystate.edu>  
From: "Scott D. Schiff" <scott.schiff@ces.clemson.edu>  
Subject: Re: MDSolids - Educational Software for Strength of Materials

Tim:

I will try to incorporate your program into my class, I was planning on using Dr. Beam and Dr. Stress, but your program handles more types of structures...Please note that I will give you additional comments after I have had a chance to play with it in more detail and see how my students interact with the program. At first glance it looks pretty good.What are the long range plans for the software? Do you plan on selling it?

Scott D. Schiff, Associate Professor  
Clemson University - Civil Engineering  
Lowry Hall - Box 340911; Clemson, SC 29634-0911

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From: Dave Byers <DBYERS@HNTB.com>  
To: 'Tim Philpot' <tim.philpot@murraystate.edu>  
Date: Wed, 14 Jan 1998 08:03:56 -0600

I have forwarded your message to a full-time professor at the University of Kansas. I am no longer at the university. I did download your program however. Great job! Do you plan to integrate the software with a textbook on the subject? I wish you the best of luck. I have thought this would be a great idea for some time... especially for a Strengths course... "A picture is worth a thousand words" Have a good day.

David D. Byers  
HNTB Corporation  
1201 Walnut Suite 700  
Kansas City, MO. 64106  
Phone: 816-472-1201  
Fax: 816-472-5013  
e-mail: dbyers@hntb.com  
<http://www.hntb.com>

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From: "Dandu, Raju" <rdandu@mail.sal.ksu.edu>  
To: "'tphilpot@msumusik.mursuky.edu'" <tphilpot@MSUMUSIK.MURSUKY.EDU>  
Subject: Thanks\_MDSolids  
Date: Wed, 14 Jan 1998 12:35:13 -0600

Prof. Philpot,  
I am Raju Dandu at KSU-Salina. I teach Strength of Materials in Mechanical engineering Technology program. I am glad you developed this software. I am ready to use in my class. Thank you.

Raju Dandu  
Kansas State University-Salina

Date: Thu, 15 Jan 1998 11:57:58 -0500  
From: Liang@IPFW.EDU (Liang,Zhongming)  
Subject: Re: MDSolids - Educational Software for Strength of Material  
To: tim.philpot@murraystate.edu

Dear Professor Philpot,

I have tried your software and found it excellent for visualizing and solving many types of problems in courses of statics and strengths of materials. Congratulations on your accomplishment and thank you very much for the opportunity to use the software. I will let you know if I would have any other comments down the load.

Wilson Liang, Associate Professor  
School of Engineering, Technology, and Computer Science  
Purdue University Fort Wayne  
Fort Wayne, Indiana 46805-1499

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From: "Majid R. Chitsaz" <mrc2@psu.edu>  
To: <tim.philpot@murraystate.edu>  
Subject: Re: MDSolids - Educational Software for Strength of Materials  
Date: Fri, 16 Jan 1998 14:35:28 -0500

Hi:

I downloaded mdsolids and played with it a little bit and liked it. I announced it to my strength of material class and asked my students to use it as a learning tool.

Thanks

Dr. Majid R. Chitsaz, P. E.  
Assistant Professor/College of Engineering Dean's Representative  
Penn State University  
Worthington Scranton Campus

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Date: Thu, 22 Jan 1998 14:53:17 -0600  
From: Bobby Taylor <bobbyt@cameron.edu>  
Organization: Technology Department - Cameron University  
To: tphilpot@MSUMUSIK.MURSUKY.EDU  
Subject: Solids Modeling Software

I love the software. I teach several engineering technology courses and the MDSolids software is one of the best I have ever seen. I appreciate the way you are sharing it with us. That is the kind of support we all need.

Thanks again. I will let you know how it goes with the software during this semester. I plan on using it in my Strength of Materials lecture and laboratory.  
P.S. What software did you use to create MDSolids?

Bobby Taylor  
Cameron University  
Lawton, OK

From: "Hansen, John G (MIS, SalemVA)" <hansen-jg@salem.ge.com>  
To: tphilpot@MSUMUSIK.MURSUKY.EDU  
Subject: MDSolids program  
Date: Tue, 27 Jan 1998 12:50:23 -0500

Tim,

I downloaded your MDSolids software this morning. Great program. I have two kids in ME at VA Tech that will make great use of your software. In my job I have to do TAF (Torque Amplification Factor) studies for steel mill drive systems. Do you know of any programs on the web (shareware or purchase) that can do a TAF analysis.

Regards,

John G. Hansen, Application Engineer  
GE Industrial Control Systems (GEICS), Rm 251

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Date: Thu, 29 Jan 1998 09:29 EST  
From: BUTTSDI@alfredtech.edu  
To: tim.philpot@murraystate.edu  
Subject: MD Solids

Hi Tim! I teach a second semester freshman course in Mechanics to our Mechanical Engineering Technology students here at Alfred each spring semester. Your announcement of MDSolids came at just the right time. I just had a quick look at it and was very impressed! I could see many possible applications. Thanks for passing the info on.

Dennis Butts

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Date: 29 Jan 98 16:50:40 +0000  
From: Roy Craig <roy\_craig@mail.utexas.edu>  
Subject: MDSolids  
To: Tim Philpot <tphilpot@MSUMUSIK.MURSUKY.EDU>  
CC: Joseph Hayton <Joseph.Hayton@wiley.com>

Tim:

I just got a chance to try out the new options that you have included in MDSolids. Boy, is it growing fast!!...The new design problems are interesting, as are the Further Explanation boxes and the help files.

...I hope we will be able to get together on what will actually be included with my book and how. I'm sure that you could put together a very good package of "ancillary materials" for both students and instructors. I'm sold on MDSolids and on your ability to keep supplying the very best software for my book. Thanks again for working with me...

Dr. Roy R. Craig, Jr.  
ASE-EM Department, MC C0600  
The University of Texas at Austin  
Austin, TX 78712-1085  
(512) 471-4172 (Office phone)

Date: Fri, 13 Feb 1998 14:07:02 -0500  
From: Lambton College Account <alan.arbour@lambton.on.ca>  
Organization: Lambton College  
To: tim.philpot@murraystate.edu  
Subject: MDSolids Availability

Hi Tim,

I am a professor at Lambton College in Sarnia, Ontario, Canada. I was given information about MDSolids through a colleague of mine. I have since uploaded the software successfully (took 2 times!) and have started to check it out. Unfortunately, I haven't had time to do a full evaluation so I wouldn't want to make any suggestions at this time. Briefly though, I love it!!

My purpose for contacting you is to verify the conditions for using it. I could obviously ask the students to download it from the Web but instead, can I put a copy of this software on our network? Please respond ASAP because I would love to have the students using it ASAP.

Thanks,  
Al Arbour (not the ex-Islanders coach!)

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Alan Arbour, P.Eng.	Phone: (519) 542-7751 Ex.216
Lambton College	Fax: (519) 542-6901
Sarnia, Ont., Canada N7S-6K4	E-mail alan.arbour@lambton.on.ca
Professor, Mechanical Engineering Technology and Technician Program	

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Date: Fri, 6 Feb 1998 11:04:40 -0700  
To: tim.philpot@murraystate.edu  
From: "Dr.Tanongsak Bisarnsin" <tanong@sura.sut.ac.th>  
Subject: MDSolids Follow-up

Hi Phil,

Just to let you know about the enthusiastic responses from my students and colleagues after I gave the demonstration. I pass along the copies to other instructors, and plan to do so to the students after I have a chance to give them proper instructions. There're some reservations from one or two of my colleagues concerning letting the students have such a powerful tools. I'm working on the localized instructions in Thai to put them online.

Anyway, I'm grateful for your generosity and contribution to the technical teaching profession. And by the way, Would you be interested in teaching here for a semester or two to do further development here as a visiting scholar?

Best regards,  
Tanong  
Dr.Tanong Bisarnsin  
Suranaree University of Technology  
Institute of industrial Technology  
111 University Avenue  
Nakhon Ratchasima 30000, THAILAND

Date: Fri, 30 Jan 1998 08:40:02 -0600  
To: tphilpot@MSUMUSIK.MURSUKY.EDU  
From: "Douglas R. Carroll" <dougc@umr.edu>  
Subject: MDSolids

Hello Dr. Philpot:

I used your MDSolids software for a couple of hours yesterday, and I am very impressed - it is the best I have seen. We are doing Mohr's circle type stuff - stress and strain - in the class now, so that is the part I spent most of my time on. I'm going to show the students in class how it works, and recommend they try it out today.

Doug Carroll  
Assoc. Prof.  
University of Missouri-Rolla

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From: "George Gray" <gray@wamet.tstc.edu>  
Organization: Texas State Technical College  
To: tim.philpot@murraystate.edu  
Date: Wed, 25 Feb 1998 13:36:48 CST  
Subject: MD Solids

Dr. Philpot,  
I currently have a downloaded version (1.4) of MD Solids. I really like it alot, because I teach courses in both Statics and Strength of Materials. Would it be possible to get a disc version... I really want to use your software to its maximum.

Thanks for your help / advice!

George D. Gray  
gray@tstc.edu

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Date: Tue, 10 Feb 1998 13:35:44 GMT  
To: tphilpot@MSUMUSIK.MURSUKY.EDU  
From: Douglas Lees <dlees@lauder.ac.uk>  
Subject: MD Solids

Dear Sir

I have recently discovered your software online and on first impressions it looks very good . As a lecturer in a further education college in Scotland, teaching Engineering subjects I wonder if it is possible to use this software to teach my students .

Yours in hope

Douglas W Lees  
College Lecturer.

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Staff,  
Lauder College, Halbeath,  
Dunfermline, Fife. KY11 5DY.  
Tel: (+44)-1383-845000  
Fax: (+44)-1383-845001

Date: Wed, 11 Feb 1998 14:45:59 -0600 (CST)  
From: Hector Estrada <estrada@vuse.vanderbilt.edu>  
To: Tim Philpot <tim.philpot@murraystate.edu>  
Subject: Re: MDSolids - Educational Software for Strength of Materials

Tim, I have downloaded the program and it works great. I have been looking for an instructional program for this class and this is exactly what I had in mind. I am not teaching Mechanics now, but I will pass this on to the other faculty here at Vanderbilt.

Thank you  
Hector Estrada  
Department of Civil and Environmental Engineering ph: (615) 343-4562  
Vanderbilt University fax: (615) 322-3365

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Date: Sun, 15 Feb 1998 12:41:55 +1100 (EST)  
From: Ian Campbell <ianc@dingo.VUT.edu.AU>  
To: Tim Philpot <tim.philpot@murraystate.edu>  
Subject: Impressive - MDSolids !

Tim,

I am impressed by your software, goodness knows how much time you have devoted to getting it to where it is at right now. I will certainly use it in my 'freshman' class starting week 1 of March, and will give you feedback during and when the Semester is over.

Surely (at some stage) you would be commercially marketing the program ?

Regards  
Ian

Ian Campbell - Course Director, Building Engineering Degree  
Faculty of Engineering and Science, Department of Civil & Building Engineering  
Victoria University of Technology  
PO Box 14428, MCMC, Melbourne, 8001, VIC. AUSTRALIA

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Date: Fri, 27 Feb 1998 12:34:13 -0500  
From: Mike Stiteler <stiteler@ix.netcom.com>  
Organization: GT  
To: tphilpot@MSUMUSIK.MURSUKY.EDU  
Subject: Great Program

Hi Tim,

Your program is really great. Have you thought of marketing it? I'm glad it's free. It is similar to Dr. Beam. Have you seen that program? It runs on Macs. They also have Dr. Duck, which shows beams under loads and lets you choose from 4 different stress/moment diagrams. It's a great tutorial for students. Thanks a lot,

Mike Stiteler, MSME  
Charleston, SC

From: "Schnettler Ty J" <schnettt@msoe.edu>  
To: <tim.philpot@murraystate.edu>  
Subject: Great program  
Date: Wed, 25 Feb 1998 07:46:23 -0600

I'm a junior mechanical engineer at the Milwaukee School of Engineering. I use MDSolids to verify my hand calculations. In strengths classes I have caught many math errors using this program.

The one question I have is in the future you might want to or if you have already contemplated it is getting the program to print out some of the graphical stuff. Like for example "Mohr's Circle". I know you can print out the text once you analyzed something. However, I don't know if I'm running into copyright laws but its just a suggestion. The reason why is we write up alot of labs and it just would be nice if we had some graphical printouts.

Thank you and great program

Sincerely, Ty Schnettler

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Date: Wed, 18 Feb 1998 11:57:00 -0600  
To: tim.philpot@murraystate.edu  
From: Scott J Leemans <sleezman@iastate.edu>  
Subject: MDSolids

I am quite impressed with your program. I am currently building a consulting business and intent to offer "review" seminars in various engineering mechanics subjects (Mechanics of Materials, Dynamics, Fluids, Design, Optimization, etc). As part of the seminars I am looking for various software programs that I can use for practical application and teaching aids. I would like to know if you'd mind me using your program, and what sort of arrangements you'd prefer to make for it's use (distribution, comissions, etc). I can be reached at the above E-mail address, or the one listed below.

Thank You for your time,

Scott J. Leemans - President  
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