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> F-Chart Software Box 44042 Madison, WI 53744 <u>http://fchart.com</u>

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1. Introduction to EESyGrader

EES (pronounced 'ease') is an acronym for Engineering Equation Solver. The basic function provided by EES is the numerical solution of linear and non-linear algebraic and differential equations. EES is used at many universities in order to provide students with the opportunity to use powerful, professional software to solve real-world engineering problems.

EESyGrader provides a tool that allows instructors to automatically grade large numbers of EES programs that are submitted by students in large enrollment classes such as Statics, Thermodynamics, and Heat Transfer. Providing students with many chances to solve problems is fundamental to their growth as an engineer. This is typically done using low-stakes homework assignments together with projects and exams. In order to motivate their progress it is important that these assessments be accurately graded. However, grading large numbers of homework assignments by hand is tedious and has limited pedogical value.

The EESyGrader program provides a solution to this problem. Students submit their EES files to your normal Learning Management System. These submissions can be downloaded to a directory where the EESyGrader program opens each one and grades them according to a rubric you have set up. The results are summarized in a grade report that can be uploaded to your Learning Management System.

EESyGrader streamlines your ability to grade problems that were done using the Engineering Equation Solver (EES) software. By automating the grading process your time or your student assistants' time can be redirected from grading to helping students when they get stuck via office hours, problem solving sessions, and online discussion forums. You can take advantage of the autograding to provide students with answers to one or more test cases so that they know if they are on the right track or should get help **before** they submit the assignment. EES will automatically generate a starter code and rubric for a solution and also allows students to automatically check that all required output variables are present in order to help prevent student submission errors. These features make EESyGrader a powerful tool that will allow you to include real-world problems in your engineering classes and provide fast and accurate feedback to students.

<u>1.1 Acquiring and Installing EESyGrader</u>

This section provides information about obtaining and installing the EESyGrader program. In order to use EESyGrader it is necessary that you are using an Academic version of EES that has an up to date Academic Update Service (AUS). Students can submit EES programs to be graded using any license of EES.

Installing EESyGrader is relatively straightforward. EESyGrader is a free program distributed by FChart Software LLC. Navigate to the download page:

https://fchartsoftware.com/ees/eesygrader.php

and select Download Now. You will be prompted to enter your name, EES License Number, and University and then asked for information about the class you intend to use it for. Provided the Academic Update Service (AUS) is up to date for the EES license number you submit, you will then be allowed to download the setup program: setup_EESyGrader.exe.

To install the program, execute the setup_EESyGrader.exe program and click the Next button from the Welcome screen. Continue to click the Next button until you see the Destination Location dialog, shown in Figure 1-1.

ng EESyGrader	×
Destination Location	
Please select the directory when installed.	re your Academic version of EES is
Destination Folder	
C:\EES32	B <u>r</u> owse
Wise Installation Wizard®	< Back Cancel

Figure 1-1: Select Destination Directory dialog.

You must instrall EESyGrader into the directory that contains your Academic License of EES. The default directory that EESyGrader will be installed into is named EES32. You can change the directory name, if you wish, by clicking the Browse button. Select Next to install the program. If successful you will see the dialog shown in Figure 1-2.

🛃 EESyGrader		×
EESy	EESyGrader has been successfully installed. Click the Finish button to exit this installation.	
	< Back Einish > Cance	9

Figure 1-2: Successful Installation.

Note that the EESyGrader program has been installed in a folder called EESyGrader that resides in the Userlib folder in your EES installation. You should check to ensure that this folder contains a program called EESyGrader.exe.

2. EESyGrader Starter Code and Rubric

2.1 Problem Statement

The first step to using EESyGrader is to prepare your assignment as you normally would. Here we will demonstrate the process using a typical undergraduate Thermodynamics problem. The problem statement is below.

Problem Statement

The figure below illustrates a free-floating piston equipped with stops. Initially, at state 1, the piston is not resting on the stops and the volume is $Vol_1 = 1 m^3$. The mass of the piston is sufficient to keep the pressure within the device at P_1_kPa = 300 kPa. The device contains the fluid R134a at 20°C.



a.) What is the mass of R134a in the piston, m_1 (kg)?

A valve is opened and R134a slowly escapes. Heat transfer keeps the temperature in the device always at 20°C. At state 2, the piston just touches the stops (at which point the volume in the cylinder has been reduced to 20% of its original value).

b.) What mass of R134a **has been removed** from the container at the moment that the piston touches down on the stops, m_out_12 (kg)?

The valve is opened again and 50% of the remaining mass of R134a in the device (i.e., half of the mass at state 2) is slowly removed. Again, heat transfer keeps the temperature in the device always at 20°C.

c.) What is the pressure at state 3 (after 50% of the remaining mass is removed), P_3_kPa (kPa)?

The valve is kept closed now and the device is cooled until R134a just starts to condense, at state 4.

- d.) What is the temperature in the device at the moment that the first droplet of liquid starts to form, T_4_C (°C)?
- e.) What is the pressure in the device at the moment that the first droplet of liquid starts to form, P_4_kPa (kPa)?

The valve continues to be kept closed and the device is cooled until R134a reaches a temperature at state 5 of -35° C.

f.) What is the quality of the R134a in the cylinder at state 5, x_5?

Note that a starter code is available on the website for you to use - it's called HW_starter.ees. Please download this from the website and do not alter anything in the header region.

Note that the problem is explicit about the variable names that must be used for the two inputs (Vol_1 and P_1_kPa) and each of the requested outputs (m_1, m_out12, P_3_kPa, T_4_C, P_4_kPa, and x_5) as well as the units that must be used for each of these quantities. Also the question refers the students to an EES starter code (HW_starter.ees) that will help the student ensure that their solution conforms to the EESyGrader format.

2.2 Problem Solution

Next, you need to develop a solution to the problem in EES that uses the variable names and units called out in the problem statement. My solution is below.

"initial pressure" "initial temperature" "specific volume" "initial mass"
"volume at state 2" "pressure at state 2" "temperature at state 2" "specific volume" "mass at state 2" "mass balance, m_out_12 is the mass
P_3_kPa (kPa)" "half of the remaining mass is extracted" "mass balance"
"temperature" "specific volume" "pressure" "pressure in kPa"
"specific volume" "quality" "pressure" "pressure in kPa"

$1_4_0 = \text{Conventiemp}(\mathbf{R}, 0, 1_4)$	
"Part f: quality when temperature reaches -35 C" T_5 = ConvertTemp(C,K,-35 [C]) v_5 = v_4 x_5 = Quality(R134a,T=T_5,v=v_5)	

The solution is shown in Figure 2-1.

Solution			
Main Key Variables			
Unit Settings: SI K Pa J m	ass rad		
m ₁ = 13.47 [kg]	m ₂ = 2.693 [kg]	m ₃ = 1.347 [kg]	m _{out,12} = 10.77 [kg]
m _{out,23} = 1.347 [kg]	P ₁ = 300000 [Pa]	P _{1,kPa} = 300 [kPa]	P ₂ = 300000 [Pa]
P ₃ = 155405 [Pa]	P _{3,kPa} = 155.4 [kPa]	P ₄ = 131673 [Pa]	P _{4,kPa} = 131.7 [kPa]
T ₁ = 293.2 [K]	T ₂ = 293.2 [K]	T ₃ = 293.2 [K]	T ₄ = 252.9 [K]
T _{4,C} = -20.2 [C]	T ₅ = 238.2 [K]	Vol ₁ = 1 [m ³]	Vol ₂ = 0.2 [m ³]
Vol ₃ = 0.2 [m ³]	v ₁ = 0.07425 [m ³ /kg]	v ₂ = 0.07425 [m ³ /kg]	v ₃ = 0.1485 [m ³ /kg]
v ₄ = 0.1485 [m ³ /kg]	v ₅ = 0.1485 [m ³ /kg]	x ₄ = 1	x ₅ = 0.522 [-]
No unit problems were detec	ted.		
Compilation time = 78 ms	Calculation time = 16 ms		

"temperature in C"

"temperature" "specific volume" "quality"

Figure 2-1: Problem Solution.

2.3 Create an EESyGrader Rubric

Once the solution is created we can develop a rubric for the problem. Select Create EESyGrader Rubric from the Options menu in EES to access the EESyGrader Rubric Dialog, shown in Figure 2-2.

F										_	
EESyGrader	Rubrio	:							-		×
Rubric Name:	Hor	mework			Created c	on:	10/23/2024	4			
EES File Name:	C:\E	ES_stuff\l	ESyGrade	r\EE	ESyGrader manual\Sa						
License #:	#10	0:			Version #	:	11.946				
Select 0-3 In	put Va	riables		5	Select 1-6 Out	put	Variables				
m_1 m_2 m_out_12 m_out_23 P_1 P_1_kPa P_2 P_3			<		m_1 m_2 m_out_12 m_out_23 P_1 P_1_kPa P_2 P_3					< >	
	App	y Inputs			🛄 Add Ou	utp	ut(s)	Cle	ar Ou	tputs	
Inpute		Namo			Value		Unite	•	2	Load Ru	ıbric
Input Variab	le 1	Name			value		Offics	E.		Save Ru	ıbric
Input Variab	le 2			٦		Γ			Bu	ild Starte	er Code
Input Variab	le 3								Ad	d Case to	o Starter
Grading Cri	teria	Nan	ne		Correct Val	ue	Correct L	Jnits	Poin	ts Marg	gin (%)
Output Var	iable 1										
Output Var	iable 2	2									
Output Var	iable 3	3									
Output Var	iable 4	+									
Output Var	iable 5	5									
Output Var	iable 6	5									
Unit Check P	ts. 0	(fo	r unit cheo	ck)	Completion P	ts	0 (ac	dded t	o eve	ry subm	iission)
× Dor	ne										

Figure 2-2: EESyGrader Rubric Dialog.

You can provide the rubric with a name (e.g., Homework, as in Figure 2-2). Next you need to identify the inputs and outputs. For this homework problem the inputs include the variables Vol_1 and P_1_kPa , so these variables should be selected from the list on the left. Select the Apply Inputs button to push these down to the inputs list in the rubric, as shown in Figure 2-3. Note that each input variable is assigned the value and units that it currently has in the EES solution.

EESyGrader R	ubri	с							_		×
Rubric Name:					Crea	ted on:	10/23/	2024			
EES File Name:	C:\	EES_st	tuff\EESy	Grader\El	ESyGrader	manua	l∖Sa				
License #:	#10	00:			Versi	on #:	11.946				
Select 0-3 Inp	ut Va	ariable	es		Select 1-6	Outpu	t Variabl	es			
P_1_kPa P_2 P_3 P_3_kPa P_4 P_4 T_1 T_2 T_3				`	m_1 m_2 m_3 m_out_1 m_out_2 P_1 P_1_kPe P_2 P_3	2 3					
	Арр	ly Inp	uts		iiii Ac	ld Outp	out(s)	i	Clear O	utputs	
lumite					Malaas		11-26-		•	Load R	ubric
Input Variable	e 1	N	ame ‹Pa		300	k	Pa			Save R	ubric
Input Variable	2	Vol_1			1	n	1^3		E E	Build Starte	er Code
Input Variable	e 3								A A	dd Case t	o Starter
Grading Crite	eria		Name		Correc	t Value	Corre	ect Uni	ts Poi	nts Mar	gin (%)
Output Varia	ble										
Output Varia	ble i	2									
Output Varia	ble .	۵ ۵									
Output Varia	ble	5									
Output Varia	ble	6									-
								1			
Unit Check Pts	5. 0		(for un	it check)	Complet	ion Pts	0	(adde	ed to ev	ery subn	nission)
× Done	2										

Figure 2-3: EESyGrader Rubric Dialog with inputs selected.

Next we need to list the outputs that will be graded. These can be done one (or more) at a time by selecting them from the list of variables in the right box and then selecting the Add Output(s) button. By selecting the outputs one at a time you can order them in a way that is consistent with the problem statement (e.g., parts a through f). If you select them all at once they will be ordered alphabetically. The result for the problem statement considered here is shown in Figure 2-4. Note that the current value and units of each of the outputs is assigned as well. You can select the Clear Outputs button to remove all outputs and start over.

s EESyGrader R	ubric						_		>
lubric Name:				Created o	n:	10/23/2024			
ES File Name:	C:\EE	S_stuff\EESyGrad	er\EE	SyGrader man	ual	\Sa			
icense #:	#100	:		Version #:		11.946			
Select 0-3 Inp	ut Vari	ables	ç	Select 1-6 Out	put	t Variables			
P_1_kPa P_2 P_3 P_3_kPa P_4 P_4_kPa T_1 T_2 T_2 T_3		~ ~	1 1	Vol_3 v_1 v_2 v_3 v_4 v_5 x_4 x_5				*	
	Apply	Inputs		🛄 Add Ou	utp	out(s)	Clear Ou	itputs	
Inputs		Name		Value		Units	•	Load Ru	oric
Input Variable	1 P	_1_kPa		300	k	Pa		Save Ru	oric
Input Variable	2 V	'ol_1		1	m	^3	Bi	uild Starter	Code
Input Variable	93						📰 Ad	ld Case to	Starte
Grading Crite	eria	Name		Correct Val	ue	Correct Uni	ts Poir	nts Marg	in (%)
Output Varia	ble 1	m_1		13.47		kg	1	5	
Output Varia	ble 2	m_out_12		10.77		kg	1	5	
Output Varia	ble 3	P_3_kPa		155.4		kPa	1	5	
Output Varia	ble 4	T_4_C		-20.2		С	1	5	
Output Varia	ble 5	P_4_kPa		131.7		kPa	1	5	
Output Varia	ble 6	x_5		0.522		-	1	5	
Unit Check Pts	. 1	(for unit ch	eck)	Completion P	ts	1 (adde	ed to eve	ery submi	ssion

Figure 2-4: EESyGrader Rubric Dialog with inputs and outputs selected.

Each of the outputs should be assigned some number of points for the grading process and you also need to specify the range of values that will be accepted as being correct during the grading process (labeled margin in Figure 2-4 and provided in %). By default, each output is assigned 1 point and any value within 5% of the correct value will be accepted, but you can adjust each of these selections. At the bottom of the dialog you can assign additional points for submissions based on whether they have any unit warnings. Finally you can assign additional completion points for every student that submits a program regardless of its correctness.

2.4 Create an EESyGrader Starter Code

It is important to provide students with a starter .ees code that will prevent them from making formatting mistakes in their code that will prevent it from being graded properly. The starter code also gives you the opportunity to provide the students with one or more test cases that they can use to understand whether their program is working or not. To do this, select the Build Starter Code button to access the EESyGrader Starter Code Dialog shown in Figure 2-5.

EESyGrader Starter	Code			_		×
Starter Code Name:	Starter Code 1					
"!EESyGrader Header S "!Do not change anyth "!To check your subm \$CheckUnits AutoOn \$AutoSetUnits Off \$AutoSetArrayUnits O \$Syntax On \$IfNot Macro "Inputs" P_1_kPa = 300 [kPa] Vol_1 = 1 [m^3] \$EndIf {\$EESyGraderOutputs "Your EES code must s "The correct outputs a " m_1 = 13.47 [kg]" " m_out_12 = 10.77 [k " P_3_kPa = 155.4 [kP	tart" ing in the header other than the ssion for required outputs select f m_1 m_out_12 P_3_kPa T_4_C P_ olve and provide values for the re shown for the test case input g]"	e value of the inputs" t Calculate->Check/Forma _4_kPa x_5} variables listed below." values"	at"			^
" T_4_C = -20.2 [C]"	Copy to Clipboard	😫 Save Starter Code	⊠ In ⊠ In	clude Test Case clude Units	e Result	s

Figure 2-5: EESyGrader Starter Code Dialog.

Select Save to save the starter code contained in the edit box as a .txt file which can be opened by EES. Alternatively, copy the text using the Copy to Clipboard button and paste it into an EES file, as shown in Figure 2-6. The starter code .ees file should be distributed to the students with instructions to place their code below the EESyGrader header. The inputs are set in the *lfNot* Macro ... *Endlf* clause which allows the EESyGrader macro to manipulate the value of these variables during the grading process.



Figure 2-6: EESyGrader code pasted into an EES file for distribution to the students.

By default, the Include Test Case Results is checked in the EESyGrader Starter Code Dialog (see Figure 2-5) so that the correct values of the output variables are included in the EESyGrader Starter Code given the values of the inputs that are used. This allows students to check their solution as they work and seek help if they get stuck. Unchecking the Include Test Case Results box will remove the test case results, as shown in Figure 2-7.



Figure 2-7: EESyGrader Starter Code Dialog with Include Test Case Results box unchecked.

If you uncheck the Include Units box then the units of the input and output variable values will also be removed.

Add a Test Case

It is easy for a student to inadvertently "hard code" one of the input values in their code such that the values of the input variables that are set in the *\$lfNot Macro ... \$Endlf* clause in the EESyGrader header are ignored. This is a frustrating mistake for students to make because the answers that are calculated match those provided in the test case; however, when EESyGrader opens the submission, sets the inputs to different values, and solves the program the outputs will not change. As a result, the student receives a poor grade on an assignment that is otherwise correct. To reduce the likelihood of this happening, it is good practice to add a second test case that is obtained by changing the values of the inputs. Students can check their answers against the first test case, change the inputs and make sure that their answers all change to the values provided for the second test case.

To add a second test case, select Done in the EESyGrader Starter Code Dialog and again in the EESyGrader Rubric Dialog. Then change the values of the input variables in your EES solution and solve. For example, in my sample EES program shown in Figure 2-8 I have changed the values of P_1_kPa and Vol_1 from 300 kPa and 1 m³, respectively (see Figure 2-1) to 400 kPa and 2 m³.

"Inputs" P_1_kPa = 400 [kPa] Vol_1 = 2 [m^3]

Solution			
Main Key Variables			
Unit Settings: SI K Pa J ma	ass rad		
m ₁ = 36.89 [kg]	m ₂ = 7.378 [kg]	m ₃ = 3.689 [kg]	m _{out,12} = 29.51 [kg]
m _{out,23} = 3.689 [kg]	P ₁ = 400000 [Pa]	P _{1,kPa} = 400 [kPa]	P ₂ = 400000 [Pa]
P ₃ = 210109 [Pa]	P _{3,kPa} = 210.1 [kPa]	P ₄ = 183458 [Pa]	P _{4,kPa} = 183.5 [kPa]
T ₁ = 293.2 [K]	T ₂ = 293.2 [K]	T ₃ = 293.2 [K]	T ₄ = 260.9 [K]
T _{4,C} = -12.26 [C]	T ₅ = 238.2 [K]	Vol ₁ = 2 [m ³]	Vol ₂ = 0.4 [m ³]
Vol ₃ = 0.4 [m ³]	v ₁ = 0.05421 [m ³ /kg]	v ₂ = 0.05421 [m ³ /kg]	v ₃ = 0.1084 [m ³ /kg]
v ₄ = 0.1084 [m ³ /kg]	v ₅ = 0.1084 [m ³ /kg]	x ₄ = 1	x ₅ = 0.3805 [-]
No unit problems were detec	ted.		
Compilation time = 94 ms	Calculation time = 15 ms		

Figure 2-8: Sample EES Solution with the input variable values changed for second test case.

Now select Create EESyGrader Rubric from the Options menu and you should see that the values of the input and output variables have been repopulated with their current values, as shown in Figure 2-9.

SEESyGrader R	ubric						-		2
ubric Name:				Created o	n:	10/24/2024			
ES File Name:	C:\EE	S_stuff\EESyGrac	ler\EE	SyGrader man	uaľ	\Sa			
icense #:	#100	:		Version #:		11.946			
Select 0-3 Inp	ut Vari	ables	9	Select 1-6 Out	put	t Variables			
P_4 P_4_kPa T_1 T_2 T_3 T_4 T_4_C T_5 Vol_1	Apply	Inputs		Vol_2 Vol_3 v_1 v_2 v_3 v_4 v_5 x_4 x_5 Add Ou	utp	ut(s)	Clear O	v utputs	
Inputs		Name		Value		Units	•	Load Rub	ric
Input Variable	e 1 P	_1_kPa		400	kF	Pa		Save Rub	ric
Input Variable	2 V	ol_1		2	m	^3	в	uild Starter	Code
Input Variable	93						iii Ad	dd Case to	Starto
Grading Crite	eria	Name		Correct Valu	ue	Correct Un	its Poi	nts Margi	n (%
Output Varia	ble 1	m_1		36.89		kg	1	5	
Output Varia	ble 2	m_out_12		29.51		kg	1	5	
Output Varia	ble 3	P_3_kPa		210.1		kPa	1	5	
Output Varia	ble 4	P_4_kPa		183.5		kPa	1	5	
Output Varia	ble 5	T_4_C		-12.26		С	1	5	
Output Varia	ble 6	x_5		0.3805		-	1	5	
Unit Check Pts	s. 1	(for unit ch	eck)	Completion P	ts	1 (add	ed to ev	ery submis	sior

Figure 2-9: EESyGrader Rubric repopulated with updated input and output variable values.

To add this new test case to the starter code, select Add Case to Starter which will add the new input and outputs to the previously generated EESyGrader Starter Code, as shown in Figure 2-10 when copied and pasted into an EES program.

Equations Window	- • X
Main	
"IESyGrader Header Start" "IDo not change anything in the header other than the value of the inputs" "ITo check your submission for required outputs select Calculate->Check/Format" \$CheckUnits AutoOn \$AutoSetUnits Off \$AutoSetArrayUnits Off \$Syntax On \$IfNot Macro "Inputs" P_1_kPa = 300 [kPa] Vol_1 = 1 [m^3] \$EndIf {\$EESyGraderOutputs m_1 m_out_12 P_3_kPa T_4_C P_4_kPa x_5} "Your EES code must solve and provide values for the variables listed below." "The correct outputs are shown for the test case input values" " m_1 = 13.47 [kg]" " m_out_12 = 10.77 [kg]" " T_4_C = -20.2 [C]" " P_4_kPa = 131.7 [kPa]" " x_5 = 0.522 [-]"	Update Hilite vars used once Main Program P_1_kPa [kPa] Vol_1 [m^3]
"If you change the inputs to:" " P_1_kPa = 400 [kPa]" " Vol_1 = 2 [m^3]" "then the outputs should change to:" "m_1 = 36.89 [kg]" "m_out_12 = 29.51 [kg]" "P_3_kPa = 210.1 [kPa]" "P_4_kPa = 183.5 [kPa]" "T_4_C = -12.26 [C]" "x_5 = 0.3805 [-]" "!EESyGrader Header End"	
BW US Line Numbers: Off Wrap: On Insert Caps Lock: Off SI K Pa J mass deg Wa	rnings: On Unit Chk:

Figure 2-10: EESyGrader Starter Code Dialog with second test case added.

Checking Program for EESyGrader Outputs

Having the second test case available in the EESyGrader header provides an easy way for students to check that they are using the input variables correctly, preventing the frustration associated with hard coding inputs. It is also easy for a student to inadvertently misspell an output variable when working through the problem. However, students using an EESyGrader Starter Code have the opportunity to check their equations and ensure that all of the required EESyGrader outputs are present. The statement:

{\$EESyGraderOutputs m_1 m_out_12 P_3_kPa T_4_C P_4_kPa x_5}

in the EESyGrader Starter Code provides a list of these outputs with the exact spelling required by EESyGrader. If students select Check/Format from the Calculate menu (or use the shortcut key Ctrl+K) then EES will check their equations and, provided they compile, indicate whether each of these variables are present.

For example, Figure 2-11 shows a student solution to this problem where the required output variable x_5 has been inadvertently misspelled, x_5 (see the last line).



Figure 2-11: Student solution in which one output variable is misspelled.

Selecting Check/Format from the Calculate menu will lead to the message shown in Figure 2-12 which alerts the student to the fact that the required EESyGrader output x_5 is not present in his/her solution.



Figure 2-12: Message indicating that the EESyGrader output x_5 is not present in the solution.

If the problem is corrected by changing the line

x5 = Quality(R134a,T=T_5,v=v_5) "quality"

x_5 = Quality(R134a,T=T_5,v=v_5)

then selecting Check/Format from the Calculate menu will lead to the message shown in Figure 2-13.

"quality"



Figure 2-13: Message indicating that all of the expected EESyGrader outputs are present.

2.5 Saving the Rubric

Finally you need to save a rubric for use by EESyGrader during the grading process. If you want the grading to be done using a different set of inputs then either of the test cases, return to your EES program and change the inputs yet again and solve, as shown in Figure 2-14.

```
"Inputs"
P_1_kPa = 500 [kPa]
Vol_1 = 3 [m^3]
 Solution
   Main Key Variables
   Unit Settings: SI K Pa J mass rad
   m<sub>1</sub> = 71.23 [kg]
                                               m<sub>2</sub> = 14.25 [kg]
                                                                                         m<sub>3</sub> = 7.123 [kg]
                                                                                                                                     m_{out,12} = 56.99 [kg]
                                              P<sub>1</sub> = 500000 [Pa]
                                                                                                                                     P<sub>2</sub> = 500000 [Pa]
   m<sub>out.23</sub> = 7.123 [kg]
                                                                                          P_{1,kPa} = 500 [kPa]
   P<sub>3</sub> = 266717 [Pa]
                                              P<sub>3.kPa</sub> = 266.7 [kPa]
                                                                                          P<sub>4</sub> = 239009 [Pa]
                                                                                                                                     P<sub>4,kPa</sub> = 239 [kPa]
   T<sub>1</sub> = 293.2 [K]
                                              T<sub>2</sub> = 293.2 [K]
                                                                                         T<sub>3</sub> = 293.2 [K]
                                                                                                                                     T<sub>4</sub> = 267.7 [K]
   T<sub>4.C</sub> = -5.493 [C]
                                              T<sub>5</sub> = 238.2 [K]
                                                                                         Vol<sub>1</sub> = 3 [m<sup>3</sup>]
                                                                                                                                     Vol_2 = 0.6 [m^3]
   Vol_3 = 0.6 [m^3]
                                              v<sub>1</sub> = 0.04212 [m<sup>3</sup>/kg]
                                                                                         v_2 = 0.04212 [m^{3/kg}]
                                                                                                                                     v_3 = 0.08423 [m^3/kg]
   v<sub>4</sub> = 0.08423 [m<sup>3</sup>/kg]
                                               v_5 = 0.08423 [m^{3/kg}]
                                                                                          x<sub>4</sub> = 1
                                                                                                                                     x_5 = 0.295 [-]
   No unit problems were detected.
   Compilation time = 78 ms Calculation time = 16 ms
```

Figure 2-14: Sample EES Solution with the input variable values changed for the rubric (graded) case.

Select Create EESyGrader Rubric from the Options menu and then select the Save Rubric button. Navigate to a folder for the assignment and save the rubric as an EESyGrader rubric (.rbc) file, as shown in Figure 2-15.

EES Select rubric file				×	<
$\leftarrow \rightarrow \checkmark \uparrow$	EES_stuff > EESyGrader > EESyGrade	er manual 🗸 ジ	Search EESyGrade	er manual 🛛 🔎	C
Organize • Nev	v folder			• ?	
 This PC 3D Objects Desktop Documents Downloads Music Pictures Videos 	↑ Name ^	Date modified No items match your search.	Туре	Size	
🚛 Windows (C:)				_	>
	•				1
File name:	Homework.rbc				~
Save as type:	EES rubric (.rbc) (*.rbc)				~
▲ Hide Folders			Save	Cancel	

Figure 2-15: Save the rubric as a .rbc file.

3. Grading with EESyGrader

In order to grade a set of student submissions you must first prepare a rubric (as discussed in Chapter 2). Students must have completed the assignment, hopefully by starting with the starter code you prepared for them (also as discussed in Chapter 2). Students should submit their .ees files and these must be placed in a folder for grading. This chapter discusses the grading process without assuming anything about the Learning Management System (LMS) that you are using. Chapter 4 provides some additional information and features that are useful if you are using the Canvas LMS for your class.

3.1 Starting EESyGrader

Open EESyGrader either by selecting the application from the Startup menu or by clicking on the EESyGrader.exe application that is installed in the /Userlib/EESyGrader folder in the folder where your Academic license of EES is installed. Initially you will see a message like the one shown in Figure 3-1 that indicates the version of EESyGrader that you have installed and the associated version of EES that you must be using. The latest version of EESyGrader available for download is also indicated.

Checking EESyGrader License	_		×
You are using EESyGrader v17 which requires EES v11.93 or higher The most most recent EESyGrader License available for download at fcha	irtsoftware.co	om is v17	
		Ok	(

Figure 3-1: EESyGrader Startup Message.

The main EESyGrader Dialog is shown in Figure 3-2.

EESyGrader V17 – Load Rubric Import Canvas Gradebook Number of Assignments: N/A Number of Students: N/A Reset Gradebook Submission directory C:\Users\Greg Nellis\OneDrive - UW-Madison\\drive\Nellis\ME 361\Fall 2024\Week 7,10 Grade Submissions	×				
EESyGrader V17	it Rubric				
Import Canvas Gradebook			Load a	l from fol	der
EESyGrader V17 – Load Rubric No Rubric Loaded Load Import Canvas Gradebook Number of Students: N/A Reset Gradebook Submission directory C:\Users\Greg Nellis\OneDrive - UW-Madison\\drive\Nellis\ME 361\Fall 20 Grade Submissions	EES	Program			
Submission directory Grade Submissions	C:\Users\Greg Nellis\OneDrive - UW-Ma	idison\ldrive\Nellis\ME 3	361\Fall 2024	\Week 7\	10_16
	17 - C × ubric No Rubric Loaded Edit Rubric Gradebook Load all from folder EES Program rectory C:\Users\Greg Nellis\OneDrive - UW-Madison\\drive\Nellis\ME 361+Fall 2024\Week 7.10_16 ssions Save Settings Make Text Files Done				
		d Edit Rubric Load all from folder EES Program ellis\OneDrive - UW-Madison\\drive\Nellis\ME 361\Fall 2024\Week 7\10_16 Save Settings Make Text Files Done			

Figure 3-2: Main EESyGrader Dialog.

Specifying the EES Program

EESyGrader opens and runs each submission using your EES program. If you have multiple versions of EES installed on your computer then you may need to specify the location of the Academic Version that you want to use with EESyGrader. You can do this by selecting the EES Program button in the upper right corner of the EESyGrader Dialog. Most users will not need to do this.

Loading a Rubric

EESyGrader requires a rubric to use when grading the submissions. While it is possible to enter a rubric manually, this is tedious and not recommended. Rather, load the rubric that you saved from EES, as discussed in Section 2.5, by selecting the Load Rubric button and navigating to the .rbc file. Select Open to import the rubric and the file being used will populate the edit box adjacent to the Load Rubric button, as shown in Figure 3-3.

👬 EESyGrader V17			– 🗆 X
Load Rubric	C:\EES_stuff\EESyGrader\EESyGrader man	ual\Homework.rbc	Edit Rubric
Import Canvas Gradebook			Load all from folder
Number of Assignments: N/A	Number of Students: N/A	Reset Gradebook	EES Program
Load Rubric C:\EES_stuff\EESyGrader\EESyGrader manual\Homework.rbc Import Canvas Gradebook Number of Assignments: N/A Number of Students: N/A Reset Gradebo Submission directory C:\Users\Greg Nellis\OneDrive - UW-Madison\ldrive\Nellis\ Grade Submissions	dison\ldrive\Nellis\ME :	361\Fall 2024\Week 7\10_16.	
			Save Settings
			Make Text Files
			Done

Figure 3-3: Main EESyGrader Dialog with rubric loaded.

If you want to view or edit the rubric, select the Edit Rubric button to bring up the Rubric Dialog. The Rubric Dialog shown in Figure 3-4 results by loading the rubric for the sample assignment developed in Chapter 2. You can modify the rubric any way you'd like at this point, including changing the point values or margins used by EESyGrader. When you are finished you can save your modified rubric with the Save Rubric button or return to the EESyGrader Main Dialog with the Done button. You can also load a different rubric using the Load Rubric button.

👬 Rubric				_		×
Rubric Name	EESvGrader\EESvGrader	manual\Homew	ork.rbc			
EES File Name	C:\EES_stuff\EESvGrade	r\EESvGrader ma	nual\Sa	Lo	ad Rubric	
Created on	10/25/2024	()			Done	
License #	#100:				Cancel	
Version #	11.947			Sa	ve Rubric	
Inputs	Name	Value	Units			
Input Variable 1	P_1_kPa	500	kPa			
Input Variable 2	Vol_1	3	m^3			
Input Variable 3						
Grading Criteria	a Name	Correct Valu	e Correct Units	Points	Margin ((%)
Output Variable	e 1 m_1	71.23	kg	1	5]
Output Variable	e 2 m_out_12	56.99	kg	1	5]
Output Variable	e 3 P_3_kPa	266.7	kPa	1	5]
Output Variable	e 4 P_4_kPa	239	kPa	1	5]
Output Variable	e 5 T_4_C	-5.493	С	1	5]
Output Variable	e 6 x_5	0.295	-	1	5]
Unit Check Pts.	1 (for unit check)	Completion Pt	s 1 (added t	to every	submissi	on)

Figure 3-4: Rubric Dialog.

Specifying the Submission Directory

Select the Submission Directory button from the EESyGrader Main Dialog and navigate to the directory where you have placed all of the .ees files submitted by the students for grading.

Save Settings Button

Select the Save Settings button to save the selections you've made for the submissions directory, gradebook file (see Chapter 4), rubric file, and EES file so that EESyGrader will default to these directory locations when opened again.

3.2 Grading with EESyGrader

Once you have loaded the rubric and selected the submission directory you should be able to grade the submissions. Select the Grade Submissions button and you should initially see a message indicating that EESyGrader is opening EES. After a few seconds you should see a message indicating that EESyGrader is grading together with a progress bar. Depending on how many submissions you are grading and how long it takes to solve each EES program the grading process can take a few minutes. On a typical windows computer with relatively simple homework problems, more than 200 submissions can be graded in less than a minute. Once

grading is complete you will see the message shown in Figure 3-5 which indicates that grading has been completed.

Information	×
Grading is complete, hit OK to see results	
	ОК

Figure 3-5: Grading Complete Message

Hit OK to return to the EESyGrader Main Dialog which should now include information about the result of the grading process, as shown in Figure 3-6.

EESyGrader V17				-		;
Load Rubric C:\E	ES_stuff\EESyGrader\EES	yGrader manu	al\Homework.rbc	Ed	it Rubric	
Import Canvas Gradebook				Load a	ll from fo	lde
Number of Assignments: N/A	Number of Stude	ents: N/A	Reset Gradebook	EES	Program	n
Submission directory C:\U	Jsers\Greg Nellis\OneDri	ive - UW-Madi	son\Idrive\Nellis\ME 3	61\Fall 2024	Week 2	\9_^
Grade Submissions						
Number of Submissions Graded:	208		Solved but complet	ion only:	0	
Completion Pts: 1 Uni	t Check Pts = 0.97/1		One or more answe	ers missing:	19	
Q1:189/208 Q2:179/208 Q3:181/2 0.91/1 0.86/1 0.87/1	08 Q4:178/208Q5:176/20 0.86/1 0.85/1	8 Q6:177/208 0.85/1	Students with unit v	varnings:	5	
Avg score: 7.16/8 Max sco	ore: 8 Min score	1	hopenyan, 401605	ARD-4877.5	te enert i	
			Students who lost p	oints:	50	
Solast Papart Format						-
General .csv file (total grades c	only)	Build	Grade Report	Save	Settings	
General .csv file (category grac	les included)	Make	Re-Upload Files	Make	Text File	s

Figure 3-6: EESyGrader Main Dialog after grading is complete.

The box to the left shows how many submissions were graded and what the average scores were on each of the questions (i.e., associated with each of the outputs, in the order they were entered in the rubric). The lists to the right indicate, from top to bottom, submissions that had no correct answers, submissions that were missing output variables, submissions that lost points due to unit warnings, and finally all submissions that lost points for any reason. Selecting an entry in any of these lists and double-clicking on it will open that submission in EES for closer investigation.

3.3 Building a Grade Report

The bottom pane in the EESyGrader Main Dialog allows you to generate a grade report. There are two formats available.

General .csv file (total grades only)

The top radio button (total grades only) creates a .csv with two columns, as shown in Figure 3-7. The first column in the csv is the submission name and the second column is the total grade for the submission.

	A	В
1	abbottkimberly, 444587, 40902355, 14845, sta	8
2	abholdjacob, 423103, 40918011, HMScompli	8
3	adamsorthomas_515486_40534808_HM5_s	4
4	adlernicholas_416158_40906754_HM5_EE5-	8
5	ahmannchristopher_423319_40894425_HM	8
6	akshantalapraket, 444422, 40908063, Praket	8
7	alexanderevan, 417961, 40823463, HwA5.EE1	8
8	atruaininuhanmed_348175_40901991_HM	8
9	atsharthorah_453672_40891918_HM5_Nora	2
10	amayaandree, 447647, 40820625, 3354853	8
11	andersorgake_344640_40834551_hw5_there	8
12	agareates, 327263, 40812661, Hers, starter	8
13	providence and a statistic presidence of the state	7
14	And a second sec	8
15	halferman d'Tribet annuales sent tellering	8
16	Annual and a second second second second	8
17	Instantial 179804 ADDITEST Fligh Barts	4
18	baumenaple 418227 40862305 HBM starts	8
19	benedichaude 343788 40833784 HBN star	8
20	bernettrobert 432271, 40875494, HMS-EE5	8

Figure 3-7: Total grades only grade report.

General .csv file (category grades included)

The second radio button (category grades included) creates a .csv with a column for each of the categories that together make up the total grade, as shown in Figure 3-8.

	A	В	С	D	E	F	G	Н	I.	J
1	File Name	m_1 (1 pts)	m_out_12 (1 pts)	P_3_kPa (1 pts)	P_4_kPa (1 pts)	T_4_C (1 pts)	x_5 (1 pts)	Completion Pts (1 pts)	Unit Check Pts (1 pts)	Total Pts
2	abbothimberly_444587_40902355_HM	1	1	1	1	1	1	1	1	8
3	abholdjacob_425103_40918011_H8/5c	1	1	1	1	1	1	1	1	8
4	adamsorthomas_519486_40934808_H	1	1	0	0	0	0	1	1	4
5	adlernicholas, 416158, 40908704, 1995	1	1	1	1	1	1	1	1	8
6	ahmannchristopher, 423319, 40894425	1	1	1	1	1	1	1	1	8
7	skshartalapraket, 444422, 40908063, F	1	1	1	1	1	1	1	1	8
8	alexanderevan_417961_40923463_Hul	1	1	1	1	1	1	1	1	8
9	atruatrianuhammed_348175_4090196	1	1	1	1	1	1	1	1	8
10	atsharthorah_453672_40891918_HW5	0	0	0	0	0	0	1	1	2
11	amayaandree, 447647, 40820625, EES	1	1	1	1	1	1	1	1	8
12	andersorgana Seesel Actosects, Nach	1	1	1	1	1	1	1	1	8
13	agareates, 327263, 40812081, Hers, y	1	1	1	1	1	1	1	1	8
14	manual and a state of the second state of the	1	0	1	1	1	1	1	1	7
15	backmanaster Addam and 72715 168	1	1	1	1	1	1	1	1	8
16	balaymax 472380 40824380 Hart. H	1	1	1	1	1	1	1	1	8
17	hangaloneolicum 481707 40834511 V	1	1	1	1	1	1	1	1	8
18	bartemuljan 375654 40895843 Elijan	1	1	0	0	0	0	1	1	4
19	baumeraple 419227 40862396 Harts	1	1	1	1	1	1	1	1	8
20	benedictuade 343768 40833764 HM	1	1	1	1	1	1	1	1	8
21	bennettrubert, 432271, 40675494, HM	1	1	1	1	1	1	1	1	8

Figure 3-8: Category grades included grade report.

3.4 Building Text Files

It may be important to guard against plagiarism in a class where all submissions are automatically graded. In order to do this, the Make Text Files button will strip the contents of the Equations Window from each of the EES file submissions and make an associated .txt file containing only this information. Select the Make Text Files and specify the directory where you would like to put each of these .txt files. EESyGrader will then activate EES and open each of the submissions in order to save it as a .txt file with the same name in the selected directory. The .txt file will only contain the information that was found in the Equations Window, as shown in Figure 3-9.



Figure 3-9: Example of a .txt file.

The text files can be easily compared in order to detect plagiarism using a variety of commercial programs. For example, the program Fast Duplicate File Finder will scan the entire directory and group student submissions based on their similarity to one another.

4. Using EESyGrader with Canvas

EESyGrader has some features that are designed for integration with the Canvas Learning Management System. These features are covered in this chapter.

4.1 Using a Canvas Gradebook

Download Canvas Gradebook

You can download your Canvas Gradebook from within Canvas by selecting Export and then Export Entire Gradebook from within the Grades tab on your course page, as shown in Figure 4-1.



Figure 4-1: Export Canvas Gradebook

Import Canvas Gradebook into EESyGrader

Once you've downloaded the gradebook file (which is a .csv file) you can load it into EESyGrader by selecting the Import Canvas Gradebook button from the EESyGrader Main Dialog and navigating to the .csv file. The number of assignments and students found in the gradebook will be reported, as shown in Figure 4-2. Select the Reset Gradebook button to clear the students and assignments list.

The second secon	EESyGrader V17 -	×			
Load Rubric	C:\EES_stuff\EESyGrader\EESyGrader manual	\Homework.rbc	Ed	it Rubric	
Import Canvas Gradebook	C:\Users\Greg Nellis\OneDrive - UW-Madiso	on\Idrive\Nellis\ME	Load a	ll from fol	der
Number of Assignments: 14	Number of Students: 216	Reset Gradebook	EES	Program	
Submission directory Grade Submissions	C:\EES_stuff\EESyGrader\EESyGrader manual\Homework.rbc C:\Users\Greg Nellis\OneDrive - UW-Madison\\drive\Nellis\ME A Number of Students: 216 Reset Gradebook C:\Users\Greg Nellis\OneDrive - UW-Madison\\drive\Nellis\ME 361\Fall 2024\Week 2\9_13_ C:\Users\Greg Nellis\OneDrive - UW-Madison\\drive\Nellis\ME 361\Fall 2024\Week 2\9_13_ Save Settings Make Text Eller				
			Save	Settings	
			Make	Edit Rubric Load all from folder EES Program Fall 2024\Week 2\9_13_2 Save Settings Make Text Files	
			l	Edit Rubric d all from folder EES Program 024\Week 2\9_13_2 024\Week 2\9_13_2	

Figure 4-2: EESyGrader Main Dialog after loading Canvas gradebook.

List of Students with no Submissions

If a Canvas Gradebook has been loaded, then an additional list will be shown after grading is completed that contains those students who are in the gradebook but did not submit an ees program, as shown in Figure 4-3.

EFSyGrader V17				-	П	×
					_	
Load Rubric	C:\EES_stuff\EESyGrader\EESyGr	ader manua	I\Homework.rbc	Edi	t Rubric	
Import Canvas Gradebook	C:\Users\Greg Nellis\OneDrive	- UW-Madis	on\Idrive\Nellis\ME	Load al	from fol	der
Number of Assignments: 14	Number of Students	: 216	Reset Gradebook	EES	Program	
Submission directory	C:\Users\Greg Nellis\OneDrive	- UW-Madis	on\Idrive\Nellis\ME 36	1\Fall 2024	\Week 2\	,9_13
Grade Submissions						
Number of Submissions Grac	led: 208		Solved but completion	on only:	0	
Q1:189/208 Q2:179/208 Q3:1	81/208 Q4:178/208Q5:176/208 Q	26:177/208	One or more answers	ters missing: 1 submissions: 8		9
0.91/1 0.86/1 0.87/	/1 0.86/1 0.85/1 0	.85/1	Students with unit wa	arnings:	5	_
Avg score: 7.16/8 Ma	x score: 8 Min score: 1		Students who lost po	ints:	50	
Select Report Format		Build	Grade Report	Save	Settinas	
General .csv file (total grad	General .csv file (total grades only) Make			Make	Taut Files	
General .csv file (category	grades included)			Make	lext Files	-
Late Penalty: 0	2 1, Section 5 (2451649)		· ·	C	one	

Figure 4-3: EESyGrader Main Dialog with list of students without submissions populated.

4.2 Canvas Grade Report File

Build Canvas-compatible Grade Report

If a Canvas Gradebook has been loaded then the Canvas Upload File option will be enabled in the Grade Report pane towards the bottom of the EESyGrader Main Dialog after grading is complete. Select the assignment that was graded from the list of assignments found in the gradebook that is to the right of the radio button. You can also set a late penalty that should be applied to submissions that have been marked late by Canvas, as shown in Figure 4-4.

EESyGrader V17			-		×
Load Rubric	C:\EES_stuff\EESyGrader\EESyGrader manual\Homework.rbc		Edit	Edit Rubric	
Import Canvas Gradebook	C:\Users\Greg Nellis\OneDrive - UW-Mac	son\Idrive\Nellis\ME		all from folder	
Number of Assignments: 14	Number of Students: 216 Reset Gradebook		EES Program		
Submission directory	C:\Users\Greg Nellis\OneDrive - UW-Mad	dison\Idrive\Nellis\ME 3	61\Fall 2024\	Week 2\9	13
Grade Submissions					
Number of Submissions Grad	ded: 208	Solved but completion only:		0	
Completion Pts: 1 Q1:189/208 Q2:179/208 Q3: 0.91/1 0.86/1 0.87 Avg score: 7.16/8 Ma	Unit Check Pts = 0.97/1	One or more answer Students without su Students with unit w Students who lost p	rs missing: bmissions: rarnings: oints:	19 8 5 50	
Select Report Format Build O General .csv file (total grades only) Make		d Grade Report	Save Settings		
O General .csv file (category grades included)			Make	Text Files	
Canvas Upload File Homework 5 EES (2456919)		Done			
Late Penalty: 1					

Figure 4-4: Canvas Upload File with assignment selected.

Select the Build Grade Report to build a canvas-compatible grade report, which is a .csv file that can be imported directly to the Canvas LMS in order to populate the grades for each student for the selected assignment.

Load Grades into Canvas

Navigate to the Grades tab of your Canvas course page and select the Import button, as shown in Figure 4-5.



Figure 4-5: Import button in Canvas.

Select the Choose File button, as shown in Figure 4-6 and navigate to the Canvas-compatible grade report .csv file that you prepared.



Figure 4-6: Choose File button in Canvas.

Select the Upload Data button shown in Figure 4-7.

⑦ What should the CSV file look like? ⇒
 Choose a CSV file to upload:
 Choose File processed_20..._361_001.csv

Upload Data

Figure 4-7: Upload Data button in Canvas.

Once the grade report file is uploaded, Canvas will prompt you to answer any questions it has about the data (e.g., students that are present in the grade file but may have dropped your class) and then provide you with a report showing the grades that will be changed in Canvas based on the information found in the upload file, as shown in Figure 4-8. Select Save Changes to save your grades in Canvas.

	Homework 5	Homework 5 EES			
Student	From	То			
enderer aller i	10	10	-		
ALCOR 0.00111	10	10			
Former Mitanian	4	4			
NORTH ADDRESS	10	10			
C-ROTOP-D-America	10	10			
Respiration (has	10	10			
1.00.0.1100000	10	10			
Reference of Property	10	10			
Read ALTONIES	8	1			
Representation of the second	10	10			
AND PROPERTY.	10	10			
Aug. 41(1)/000	10	10			
1-1-20-1000 A	10	8			
accesses access	10	10			
ACTOR BACODOR	10	10			
No. Sales	10	10			
CONTRACTOR OF CALL (MIL	10	4	-		
4)		
Save Changes Cancel					

Figure 4-8: Report of grades that will be changed in Canvas.

4.3 Canvas Re-Upload Files

Canvas allows you to re-upload a file for each student that has the same name as the downloaded submission file. EESyGrader will therefore create a set of .ees files, one for each student, that contains only a report showing why the student received the grade that they did on the assignment. To build these Re-Upload Files select the Make Re-Upload Files button and navigate to the folder where you would like to keep these files. Once completed, each of the .ees files in the directory will contain a grade report, as shown in Figure 4-9.

Equations Window			- • ×
Main			
"!EESyGrader Grade F	Report"		Update ?
\$Syntax On			Hilite vars used once
\$Font 12			
\$TabStops 2 in			Main Program
"m_1:	1 out of 1"		
"m_out_12:	1 out of 1"		
"P_3_kPa:	1 out of 1"		
"P_4_kPa:	1 out of 1"		
"T_4_C:	1 out of 1"		
"x_5:	1 out of 1"		
"Completion Pts:	1 out of 1"		
"Unit Warning Pts:	1 out of 1"		
"Total Pts:	8"		
BIW US Line Numbers: Off	Wrap: On Insert	Caps L	ock: Off SIK Pa J ma

Figure 4-9: Re-Upload File.

Select all of the files in the folder and zip them up. In Canvas go to the Assignments page and then select the assignment of interest. Select the Re-Upload Submissions button that appears in the side bar, as shown in Figure 4-10, and then the Choose File button to navigate to the zip file containing the re-upload files. Finally select the Upload Files button.

Published & Assign To Setit	Related Items
	⟨♡⟩ SpeedGrader
	ightarrow Download Submissions
	If you made changes to the student submission files you downloaded before, just zip them back up and upload the zip with the form below. Students will see the modified files in their comments for the submission.
	Make sure you don't change the names of the submission files so we can recognize them.
Until	Choose File No file chosen
Sep 16 at 5pm	Upload Files
-	
-	207 out of 208 Submissions Graded

Figure 4-10: Re-Upload Submissions button.

Each student will now be able to go to their account and download the re-upload file containing their grade report.

5. Troubleshooting EESyGrader

EESyGrader works by generating a macro file that is run (in the background) and opens each ees file, sets the inputs, solves the file, and exports the outputs to a file that is subsequently graded for correctness against the rubric. The macro file is saved in your ees directory as EESyGrader.emf and can be examined either from within EES (by opening the Macro from the Macro Window) or outside of EES using a text editor. The macro itself generates a log file as it runs that is named EESyGraderLogFile.log and is placed in the EESyGrader folder of your Userlib directory. In situations where EESyGrader fails to open and grade every submission it is often possible to see where it ran into trouble by investigating the log file. If the grader stops at a particular submission you might want to remove that submission from the directory containing the submissions being graded. Occasionally a student may submit a corrupt file or one that will not open. You can investigate the file outside of the grading process to diagnose the issue.