Michigan Tech MEEM/EE 5295 Advanced Propulsion for HEV Student Questionnaire – Survey

Name: ARJUN DARBHA

This questionnaire and will help us guide the course instructional activities.

What is your educational backs	ground?	
Electrical Engineering	6	
Mechanical Engineerin	g	
Material Science / Engi		
Chemical Engineering	eering	
Other		
The highest degree you have re	eceived is:	nin cermiosivi-5 to :
BS		95
MS		The second of th
PhD		
Other		
I have taken the following cours	ses (mark all that apply):	
MEEM/EE 4295 Introdu	action to Propulsion Systems for H	FV's
MEEM/EE 4296 Introdu	iction to Propulsion Systems for H	EV's Laboratory
MEEM 5990 Advance Pr	ropulsion for HEV (Semester	LV S Laboratory
Are you currently taking the lab	class MFFM/FF 52062	2
, and the state of the lab		
Yes	oldss MEEIVI/ EE 3230 !	Confregation
Yes	Class William, EL 3290:	Coeff state
Yes No	Class Milely, LE 3290:	is a soft spoint.
Yes	Class William, EL 3290:	in and enter 1,00 to a relegance vetam well.  Here I are to be a conserved and well.
Yes No Are you in the HEV Enterprise?		Coert state  in a constant of the contemps where well in  itseen a noting of
Yes No Are you in the HEV Enterprise?	acity / area	May translation is a stress with a series in the series in
Yes No  Are you in the HEV Enterprise?  Yes, If yes in what capa No	acity / area	Roadt sjoht  sel sarute I Di to grelgamse veras well  lisses I nob to 0  derende de pero de steament
Yes No  Are you in the HEV Enterprise? Yes, If yes in what capa No  Have you or are you now involve	acity / areaed in other enterprises?	Coart spoid  The contract of the contract volume world be a contract of the co
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How many semesters of controls and other related course material have you had?

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0 or don't recall
        Included as part of another course
        More than 2
 How many semesters of circuits have you had?
        0 or don't recall
        Included as part of a physics course
      1
        More than 2
How many semesters of E-Machines and/or power electronics have you had?
     or don't recall
        Included as part of another course
        2
        More than 2
How many semesters of batteries or other related course material have you had?
      or don't recall
        Included as part of another course
        2
        More than 2
How many semesters of IC Engines have you had?
       0 or don't recall
      Included as part of a thermodynamics or other course
       2
       More than 2
Experience and Work Background
What best represents your current or most recent position?
       Undergraduate Student
     Graduate Student
       Work in Strategy Development (Area ___
       Work in Software Development (Area ___
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Work in Calibration (Area
Work in Validation (Area _____)
Work in Research (Area ____
Work in Program Management (Area _
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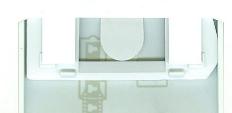
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Other		
If you are involved hybrid development,	what subsystem are you involved	lino
	what subsystem are you involved	IIIIII
Not involved / Not Applicable		
Vehicle		
Batteries		
Powertrain		
E-Machines		
Other		
What programming languages have you	worked in (mark all that apply)?	
Assembly		
ć		
Fortran		
Basic		
MathWorks (Matlab/Simulink)		
Other R, Python	?	
The state of the s		
V		
What is your experience level in MathWo	ork's Matlab?	
Have not used		
Limited		
Moderate Experience		
Expert		
C		
What is your experience level in MathWo	ork's Simulink?	Commence of the State of the St
Have not used		
Limited		
Moderate Experience		
Expert		
Do you have access to MathWorks Matla	b/Simulink software (Mark all tha	at apply)?
No		
Yes at school		
Yes at work		
. Yes at home		



## General questions on modeling and HEV's

Given the following equation:

 $\ddot{x} + b\dot{x} + cx = f(t)$ 

Did you recognize this as a second-order, ordinary linear differential equation in x?

Yes

No

Could you solve the homogeneous equation analytically?

Yes

Yes with a bit of review

Not without significant review or instruction

Could you solve the equation numerically?

Yes

Yes with a bit of review

Not without significant review or instruction

Could you write the transfer function for this?

Yes

Yes with a bit of review

Not without significant review or instruction

Could you write this in state-space notation?

Yes

Yes with a bit of review

Not without significant review or instruction

Could you solve the equation in Simulink?

Yes

Yes with a bit of review

Not without significant review or instruction

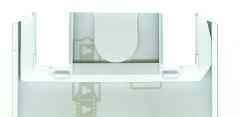
What additional information is needed in addition to b, c and f(t) to solve this initial value problem? \_\_\_\_

Initial conditions @ 2=0 and t=0.

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For an IC Engine BSFC stands for what? B neak Specific Fuel Consumption

For a battery what does SOC stand for? State of Change. In a hybrid such as the Toyota Prius what fraction of the energy originally comes from the battery? In the following equation for the drag force on a vehicle, Cd is the <u>Coefficient</u> and a typical value or range for a light duty vehicle would be <u>0.3</u> to <u>0.5</u>.  $F_{drag} = \frac{1}{2} C_d \rho A_f V^2$ **Course Expectations** What are your expectations from this course? Twould like to be able to model any hybrid architecture given a derive ay le. I should be able to make decisions and attaibute some fidelity to these decisions, parofessionally. List two specific learning objectives you would like to satisfy as an outcome of this course? be knowledgable about the technical details of averent technologies in hybrids: How many hours per week outside of class do you expect to commit to this course 4-5 hours A-By technical details I mean about their existance and
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The powertrain below is an example of what type (architecture) of hybrid? <u>Series Hybrid</u>

Batteries

Please provide additional input to assist in delivering the course and team generation.

Hy team has maximum diversity possible, and I have no qualms about this; but your grandom team gene gration technique might not ensure diversity in all teams.

Please provide ample time for the final peroject homework. I would not give my fullest due to lock of time.

What is your favorite interest outside of work/school (optional).

Jam a connoisseur of good books and good food. I usually-dipriory meading English (UX) writers. And in tenns of food, I have this unvaring ability to married spoil whatever I cook, which means I don't nearly wormy about enjoying food.

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