Prerequisites Survey/Test ME 460/660: Mechanical Vibrations Instructor – Dr. Joseph C. Slater

Students Name:	 Score:	 points	out of	10	points

The purpose of this survey/test is to assess how prepared you are for this course and to see how well the prerequisite courses are covering the material required for this course. Please fill out the general information on each course, check the appropriate box that best describes the level of understanding that you feel you have for the topic, and then work out the test question. This test will constitute 5% of your grade for this quarter. Note that no test points are given or deducted for how you respond to the student assessment portion of the form.

Simple Laplace Transform Table:

F(s)	F(t)
sX(s) - x(0)	$\dot{x}(t)$
$s^2X(s) - sx(0) - v(0)$	$\ddot{x}(t)$
$\frac{a}{s^2+a^2}$	$\sin(at)$
$\frac{s}{s^2+a^2}$	$\cos(at)$
1	$\delta(t)$
$\frac{1}{s}$	u(t)
$\frac{1}{s^2}$	t
$\frac{1}{s-a}$	e^{at}
$\frac{1}{s^n}$	$\frac{t^{n-1}}{(n-1)!}$

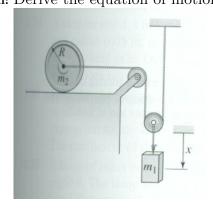
			ormation on Prereq	uisite Course	
Student Assessment of Their Knowledge of Prerequisite Topic for Course Listed Above Check box below applicable response Topic ABET Topic Letters C Topic Letters C Topic C ABET Topic Letters C ABET Topic C ABET Topic Letters C ABET Topic C ABET Top	Course				Grade (4.0 scale)
Topic ABET Topic Letters Point Can Explain or Apply Concept Point Poi	ME 213: Dynamics				
Topic ABET Topic Letters $Can Explain \ or \ Ap$ $Heard \ of \ Topic$ $Never \ Heard$ $Topic$ Free Body Diagrams A Test Question Assessment of Student's Prerequisite Knowledge Question: Derive the equation of motion of the following system: K K K K K K K K	Student Asses	ssment of Their Kno			
Test Question Assessment of Student's Prerequisite Knowledge Question: Derive the equation of motion of the following system: $F(t)$	Topic		Can Explain or Ap-		Never Heard of
Question: Derive the equation of motion of the following system:	=	A			
K M K	Te	est Question Assess	ment of Student's P	Prerequisite Know	ledge
	Question: Derive	^_	m		
	Answer:		X(t)		

out of 2 points

Grade:

General Information on Prerequisite Course							
Course	Where Taken	Term/Year	Instructor	Grade (4.0 scale)			
ME 213: Dynamics							
Student Asses	sment of Their Kno	wledge of Prerequis	site Topic for Cours	e Listed Above			
		Check box below applicable response					
Topic	ABET Topic Let-	Can Explain or Ap-	Heard of Topic	Never Heard of			
	ters	ply Concept		Topic			
Kinematics and Ki-	A						
netics							
Test Question Assessment of Student's Prerequisite Knowledge							

Question: Derive the equation of motion of the following system:



Answer:

 $Grade: \underline{\hspace{1cm}} \text{ out of } \underline{4} \text{ points}$

	General Info	ormation on Prerequ	uisite Course	
Course	Where Taken	Term/Year	Instructor	Grade (4.0 scale)
EE 321: Linear Sys-		,		(,)
tems I				
tems i				
Student Assess	sment of Their Kno		site Topic for Course	
			ox below applicable	
Topic	ABET Topic Let-	Can Explain or Ap-	Heard of Topic	Never Heard of
	ters	ply Concept		Topic
Laplace transform	\mathbf{A}			
of differential equa-				
tion				
Te	est Question Assessi	ment of Student's P	rerequisite Knowled	lge
Question: Find th	ne Laplace domair	a solution of $x(t)$.	X(s), given the go	overning equation
		and $\mathcal{L}(\sin(at)) = \frac{1}{8}$		o quario
	$x + 4x - \sin(3t)$	and $\mathcal{L}(\sin(at)) = \frac{1}{8}$	$a^{2}+a^{2}$.	
Answer:				

	General Inf	formation on Prerequ	uisite Course	
Course	Where Taken	Term/Year	Instructor	Grade (4.0 scale)
EE 321: Linear Sys-				2,440 (4.0 00000)
tems I				
Student Asses	sment of Their Kno	ubledge of Prerequis	ite Topic for Cours	e Listed Above
			ox below applicable	
Topic	ABET Topic Let-	Can Explain or Ap-	Heard of Topic	Never Heard of
_	ters	ply Concept		Topic
Fourier series	A			
		ment of Student's P	rereguisite Knowled	lge
				-
Question: Find the	he first three ter	m of the Fourier s	series of the repea	ating function for
which	x(t) = 0 from t	= 0 to $t = 1$, and	d x(t) = -1 from	t = 1 to t = 2,
	ng every 2 second		· /	,
Hint:		-		
	$a_0 + \sum_{i=1}^{\infty} a_i$	$a_{\alpha}(x_{i}, t) + b_{\alpha} = (-1)^{\alpha}$, , , t)) whom	$-2\pi/T$ and $T :=$
		$\cos(n\omega_T t) + b_n \sin(r)$	$\omega_T \iota_{JJ}$ where ω_T =	$-2\pi/I$, and I is
	riod_{aT} of the function	on		
$a_0 = \frac{2}{T}$	$\int_0^T F(t)dt$			
1	$\int_0^T F(t) \cos(n\omega_T t)$	dt and		
$a_n - T$	$\int_0^T f(t) \cos(n\omega_T t)$	ojac, and		
$b_n = \frac{2}{T}$	$\int_0^T F(t) \sin(n\omega_T t)$)dt		
Answer:				
Grade: out of	2 points			