

MECH4613 (AUE 425) - Mechatronics for Automotive Engineers - Fall 2020

Take Home Exam 3

Deadline: 15 January 2021

Your hybrid drive train versions are given in the below table. You will write **two** Matlab scripts (M-File). One will make calculations according to Max. SOC of PPS Control Strategy. The other will make calculations according to Engine On-OFF (Thermostat) Control Strategy. Braking will not be considered in the code. In the below table your parameters are given. Your program should ask user to enter the **demanded traction power and current SOC value of the battery**. Accordingly, your code should determine the **engine power, battery power and electric motor power**. Copy-paste your two Matlab scripts (M-file) to a Word document. Run your code for different possibilities and check whether it works for all cases. I will run your code for the following scenarios:

- 1) Operation Point A, battery SOC is in the minimum
- 2) Operation Point A, battery SOC is above minimum
- 3) Operation Point B, battery SOC is in the minimum
- 4) Operation Point B, battery is in the maximum

Note: If the code does not work, no points will be given.

		Hybrid Drive- Train Type	Control Strategies	Engine Optimum Power (kW)	Maximum Motor Power (kW)	SOCmin (%)	SOCmax (%)
1	214ME2252	Series	Max SOC, Thermostat	30	50	20	80
2	216ME2273	Parallel	Max SOC, Thermostat	35	55	20	80
3	217AU2355	Series	Max SOC, Thermostat	40	60	30	70
4	212AU2121	Parallel	Max SOC, Thermostat	45	65	30	70
5	215ME2272	Series	Max SOC, Thermostat	50	70	20	80
6	216ME2275	Parallel	Max SOC, Thermostat	55	75	20	80
7	217ME2261	Series	Max SOC, Thermostat	60	80	30	70
8	216ME2259	Parallel	Max SOC, Thermostat	65	85	30	70
9	215TME2252	Series	Max SOC, Thermostat	70	90	20	80
10	215MC2283	Parallel	Max SOC, Thermostat	75	95	20	80
11	209ME2053	Series	Max SOC, Thermostat	80	100	30	70
12	213MC2101	Parallel	Max SOC, Thermostat	85	105	30	70
13	214ME2265	Series	Max SOC, Thermostat	90	110	20	80
14	218AU2298	Parallel	Max SOC, Thermostat	95	115	20	80
15	212AU2214	Series	Max SOC, Thermostat	100	120	30	70