Final Year Project Proposal
Session 2015/2016

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No	Project Title / Field of Study	Problem Statement	Objective(s)	Scope(s)	Expected Outcome(s)	List of component (Hardware/Software to be used)	Estimated Budget **to be bourne by supervisor's research grant*
1	Failure analysis of leaf spring for commercial vehicle Field of study: Applied Mechanics	The leaf spring for the commercial vehicle will be failed due to loading, road surface, and vibration (resonance phenomenon).	1. To investigate the root causes of lead spring failure of the commercial vehicle. 2. To determine the failure operating speed / vibration frequency of the commercial vehicle.	1. The commercial vehicle to be considered is the pickup truck. 2. Finite Element (FE) software to be used is ANSYS / CATIA for modeling the rear leaf spring suspension system.	1. The FE model of leaf spring for pickup suspension system is developed. 2 The failure analysis results of leaf spring can be as the references for designing the suspension system of commercial vehicle.	1. LMS Virtual Lab 2. ANSYS / CATIA software	RM50
2	Sound transmission loss of natural fiber panel Field of study: Applied Mechanics	Sound transmission loss (STL) of natural fiber panel may vary respect to different thickness, size, and density of the panel.	1. To evaluate the sound transmission loss (STL) of natural fiber panel in terms of thickness, density, and size. 2. To justify the most effective investigated parameter of the panel deliveries the high STL for the selected frequency range.	1. The suggested natural fiber panels used in the experiment are the panels made from fiber of napier grass, coconut, and rice husk. 2. The STL natural fiber panel measurement is conducted according to ISO standard.	1. STL of natural fiber will be difference for different thickness, size, and density of panel. 2 The STL analysis results of natural fiber panel can be used as the reference for noise control engineer for the noise insulation.	1. Microphone 2. LMS Test Express 3. Sound level meter 4. LMS Virtual Lab 5. PC/Laptop	RM300

3	Development of acoustical simulation model for impedance tube Field of study: Applied Mechanics	A simulation model able to be used for predicting the sound absorption coefficient of specimen tested in impedance tube.	1. To develop an acoustical simulation model for impdance tube. 2. To determine the sound absorption coefficient of the test specimens, such as foam, porous materials by using the developed simulation model.	1. The developed simulation model able to predict sound absorption coefficient of specimen for the frequency range 100 Hz to 4800 Hz. 2. Acoustical software to be used is LMS Virtual Lab.	1. The learned engineering knowledge is applied for designing and developing a simulation model impedance tube. 2. The predicted sound absorption coefficient of sound absorbing material can be compared and validated with the measured by using the impedance tube.	1. PC/Laptop 2. LMS Virtual Lab software 3. ANSYS software	RM20
4	Sound level measurement for lecture room in UniMAP Field of study: Applied Mechanics	Sound level of lecture room in UniMAP may vary respect to different location, design, and space volume.	1. To determine the sound level of lecture room in UniMAP in the aspect of location, design, and volume of space. 2. To justify the most effective lecture room design where enables to provide a comfortable environment for lecturing.	1. The sound level meter is used to measure the sound level of selected lecture rooms in UniMAP. 2. The measurement is conducted under the empty condition of the lecture room.	1. The sound level will be difference for different location, design, and space volume of the lecture room. 2. The measurement technique might be applied for the sound level measurement of car/train cabin.	1. Microphone 2. LMS Test Express 3. Sound level meter 4. LMS Virtual Lab 5. PC/Laptop	RM50
5	Optimization of resonator sound absorber. Field of study: Design &	Problem occurring when deciding the optimum parameters for a resonator sound absorber to	1. To determine the optimum parameters of a resonator sound absorber for wider band sound	1. The optimization evaluation is used to tune the sound absorption coefficient more than 0.5 for the selected frequency	1. The optimum parameters of resonator sound absorber for wider band and higher sound absorption coefficient can	1. PC/Laptop 2. Matlab software	RM20

	Manufacturing	provide wide range sound absorption coefficient.	absorption coefficient. 2. To develop the related optimization algorithm for resonator sound absorber.	range. 2. The suitable / simulated annealing (SA) optimization algorithm is used for the optimization study. 3. The optimization evaluation software to be in this study is Matlab.	be obtained. 2. The developed optimization algorithm or technique can be applied in other applications.		
6	Design of sound absorption enclosure for noisy machines Field of study: Design & Manufacturing	Suitable and optimal design sound absorption enclosure is needed for the noisy machines to reduce its noise level emitted to surrounding.	1. To determine the parameters of sound absorption enclosure where reduces the emitted noise significantly. 2. To design the sound absorption enclosure which able to insulate the noise level emitted by the noisy machines.	1. The noisy machines can be used for investigation are air-conditioner compressor, chain saw, and others. 2. The simple rectangular shaped of enclosure is proposed for this sound absorption enclosure design.	1. The optimum parameters of sound absorption enclosure for reducing the noise level emitted by noisy machines can be obtained. 2. The developed sound absorption enclosure can be applied in other applications which insulate the noise level emitted.	1. Microphone 2. LMS Test Express 3. Sound level meter 4. LMS Virtual Lab 5. PC/Laptop	RM300