MECH 3660 9660 – Manufacturing Engineering
3D Printing Laboratory
Group Report

(This assessment is worth 5% of your total mark in MECH3660 9660)

During your laboratory session on the 3D Printing Laboratory kit you will be taking part in the production of a unique component or assembly generated by yourself prior to attending the Laboratory. You must attend the Laboratory that you have been assigned too. Note carefully the instructions provided for your task and refer to your demonstrator for any questions you may have. Limit the size of the component to dimensions under 70mm in all three axes.

Safety is critical. If you are not wearing closed shoes you will be refused entry to the lab.
You must also abide by all of the safety instructions given to you buy your demonstrator / lecturer.

During your time in the laboratory your group should be trying to your response to the following questions (you may need to do some additional research after your laboratory)

Ensure that the work is divided equally between all of your group members (groups of 1, 2 or 3 are O.K.). Please note each group member's name and their contribution on the cover sheet of your report. You may pick one of the designs produced for printing not all group members' designs need to be printed.

1. What is the main function of the component (or assembly) that you are printing today? (Please include an accurate Third Angle Projection Drawing to AS1100 which includes all tolerances)

2. Compare the component as designed using SolidWorks (or another CAD system) with the final product that you have produced. Comparative features include but are not limited to; tolerance (linear and geometric – is the object warped or burnt?), surface finish etc. A pair of Vernier callipers may be temporarily borrowed from room S319a or S318 after a student card has been handed to a demonstrator or lecturer.

3. Research the material that you have printed your object in (most likely ABS) and discuss its strength properties and any limitations.

4. Discuss in detail, each key step of the 3D Printing, Fused Deposition Process (FDP) with focus on how successful printing your component was using this method.
   (You may like to read through the User Manual, do additional research through the recommended texts and or suitable WEB references).

5. If your group was given the opportunity to reprint your component / assembly, what changes would you recommend making to the design, 3D printer settings or the printing environment?

6. How could you improve the surface finish and stay within design tolerance?

7. Discuss an alternate 3D Printing system to FDP that could produce your group's component with a better outcome in terms of the component's strength, finish or dimensional accuracy.

8. Include a conclusion on how successful your group's attempt was at printing your components. Include all references used throughout this report.

This laboratory report is due two weeks from when you attended your 3D Printing Laboratory. The completed report is to be placed in the assignment box for MECH3660 9660 located on the third floor of the Mechanical Engineering Building – outside the Purcell Room.

THIS REPORT SHOULD TAKE AN AVERAGE GROUP OF STUDENTS 6 HOURS TO COMPLETE