Dyson School of Design Engineering

DE 2 Electronics 2

Final Laboratory Oral Examination Guidelines (2024)

Peter Cheung, version 2.3

Assessment on Lab 4 - 6 and the challenges will be in the form of a 15-minute oral examination in pairs of lab partners **together** with one of three Assessors on Tuesday 19 March 09.00 to 12.00 and 13.00 – 15.00. If you or your partner are unable to attend the Lab Oral at the appointed time, please find another pair willing to swap with you and inform me via email. A schedule for the examination is shown below. **This is a formal assessment, and you are REQUIRED to be present at the allotted time**. The Lab Oral will take place in in RCS1 Room 110 (Digital Learning Hub).

The purpose of the Oral examination is to establish how much you have learned in the second half of this term, and how much you have achieved in the Challenges. Questions will be asked to establish your level of understanding and how effectively you have conducted the experiments including the effective use of your logbook for Labs 4 - 6. You are expected to keep your own logbook. If you share a logbook, you must demonstrate that it is not a ONE PERSON effort alone, i.e. you will be tested on contents in the logbook even if you were not the one who "kept" it!

During the oral, you are also expected to show what you have achieved for the challenges. **I strongly recommend that you take short videos of the challenge outcomes with your phone, instead of demonstrating live.**

YOU MUST BRING YOUR SEGWAY ASSEMBLY, THE PYBENCH CARDBOARD BOX, ALL CABLES, ASSESSORIES AND LITHIUM BATTERY WITH CHARGER, BULB BOARD AND EVERYTHING ELSE ASSOCIATED WITH THIS MODULE TO YOUR LAB ORAL. NO MARKS WILL BE RECORDED OR RETURNED UNTIL I HAVE RECEIEVED YOUR COMPLETE KIT.

The learning outcomes for each Lab are summarized below. It is helpful if you consider to what extend you have understood with respect to this list of learning outcomes.

Lab 4: IMU and OLED Display

How accelerometer and gyroscope can be used to measure pitch and roll angles; their strength and limitations; how the limitations of both type of sensors can be mitigated; how to write stand-alone program in uPy; what happens when you power up the PyBench hardware board; understanding of what the Matlab and uPy code do.

Lab 5: Motor speed measurement & Polling vs interrupt

Explain how motor speed can be measured using Hall effect sensors; demonstrate understanding of the difference between polling and interrupt and their relative advantages and disadvantages; explain how MicroPython can be used to set up various interrupt mechanisms so that interrupts happen; explain what is an interrupt service routine and how to write a good one.

Lab 6: Buffering and Beat Detection

Explain how timer can be used to determine and control the collection of real-time audio data at a fixed sampling rate; show how to use memory of the microcontroller to capture and store a block of data; instantaneous energy can be used to determine the beat of music; suggest possible improvement in the skeleton algorithm provided.

Weighting for the Final Week Lab Oral

The Final Week Lab Oral is worth 25% of the module. 15% will be on the performance in Lab 4-6. This is the same weighting as the DRAW week Lab Oral. 10% of will be on the achievement with the challenges.

DE2 Final week Lab Oral Schedule - Tuesday 19 March 2024

Group	Student 1	Student 2	Student 3	Time	Assesor
7	Langton, Michael	Iqbal, Zara		09.20 - 09.40	Examiner 1
35	Yang Zhang	Ling Liu		09.20 - 09.40	Examiner 2
13	Krzysztof Wancerski	Jonathan Cheung		09.20 - 09.40	Examiner 3
43	Rai , Akriti	Singh , Vaibhav		09.40 - 10.00	Examiner 1
16	Gould, Harvey	Grose, Christian		09.40 - 10.00	Examiner 2
45	Mabey, Leyla	Hussain, Danyaal		09.40 - 10.00	Examiner 3
36	Javier de la Fuente	Cesar Asensio		10.00 - 10.20	Examiner 1
26	Caitlin Carlos	Tamara Carpar		10.00 - 10.20	Examiner 2
40	Anastasia Cattaneo	Olena Viazmitinova		10.00 - 10.20	Examiner 3
32	Rastelli Francesco	Ahmed Zain		10.20 - 10.40	Examiner 1
50	Alex Wilson	Daniel Hasan		10.20 - 10.40	Examiner 2
20	Kaitai Yang	Andy Liu		10.20 - 10.40	Examiner 3
9	Lee, Gabriela (Pui Chak)	Cheah, Shawn		10.40 - 11.00	Examiner 1
15	Andrews, Charlotte	Young, Imogen		10.40 - 11.00	Examiner 2
22	Sicheng Shu	Yixing Wang		10.40 - 11.00	Examiner 3
44	Ruby Kennedy	Sarah Gu		11.00 - 11.20	Examiner 1
33	Li, Qinxuan	Tang, Miaoyan		11.00 - 11.20	Examiner 2
38	maxim Weill	HaoZhen Jia		11.00 - 11.20	Examiner 3
27	Hall, Zoe	Ing, Reiya		11.20 - 11.40	Examiner 1
29	Cai Yicheng	Shi Yiding		11.20 - 11.40	Examiner 2
25	Ella Phillips	Josh Reynolds		11.20 - 11.40	Examiner 3
4	Kurzman, Solly	Stobbs, Rafi		11.40 - 12.00	Examiner 1
5	Seo, Yujeong	Kim, Erik		11.40 - 12.00	Examiner 2
6	Gaomeng Tie	Xiangsong Zhang		11.40 - 12.00	Examiner 3
42	Haynes Emily	Ranaweera, Tharindu		13.00 - 13.20	Examiner 1
10	Dharmawardene, Chehara	Ioannides, Andria		13.00 - 13.20	Examiner 2
34	Lee Han Anne	Arancha Ramirez		13.00 - 13.20	Examiner 3
3	Nicholson, Frederick	Feng, Zile		13.20 - 13.40	Examiner 1
24	Wright, Liberty	Ball, Matthew		13.20 - 13.40	Examiner 2
18	Miao Constance	Zhang Alina		13.20 - 13.40	Examiner 3
37	Ferguson, George	Bloch Angus		13.40 - 14.00	Examiner 1
1	Haji-Ioannou, Erietta	Garces Beavis, Daniella		13.40 - 14.00	Examiner 2
8	Alex Li	Dylan Hoang		13.40 - 14.00	Examiner 3
28	Bendor Aaron	Hamlet Greg		14.00 - 14.20	Examiner 1
17	Ashley Yang	Meihan Chen		14.00 - 14.20	Examiner 2
30	Wu, Yifan	Fang, Gexing		14.00 - 14.20	Examiner 3
19	Jingyang Liu	Chuwei Xiong		14.20 - 14.40	Examiner 1
46	Hal(Haoran) Feng	Jennifer (Zihan)Zhang		14.20 - 14.40	Examiner 2
31	Wang Zhuoxiaoyue	Wang Zhihan		14.20 - 14.40	Examiner 3
23	Josh Williams	Sam Gray		14.40 - 15.00	Examiner 1
47	Shirley Xiong	Flora Li		14.40 - 15.00	Examiner 2
14	Hu, Hongyi	Yan, Tianle		14.40 - 15.00	Examiner 3
12	Saar, Stefan	Edward Rafael Isola	Liu, Chris	15.00 - 15.20	Examiner 1
2	Gök, Acar	Lehrell, Patrick	Lloyd White, Seamus	15.00 - 15.20	Examiner 2
21	Emmanuel Irechukwu	Sinai Rhodes		15.00 - 15.20	Examiner 3

Imperial College London

DE2 Electronics 2 – Final Week Lab Oral Feedback Form

Students1 | **Lab Grade for 1:**

Student 2 | **Lab Grade for 2:**

Name of Assessor: | Grade on Challenges:

Performance on the Lab Experiments 4, 5 & 6. (use 1 & 2 to indicate individual's performances)

1. Logbook Quality and Effectiveness

Highly effective | Effective | OK | Contrived | Poor

2. Ability to answer questions from the logbook

Excellent | Good | OK | Poor | Very poor

3. Effort in completing Lab 4 to 6

Fully engaged Strong evidence	Good engagement Good evidence	Acceptable Engagement	Below expected Engagement	V. poor Engagement

4. Examiner's opinion on candidates' depth of understanding in general

Broad & deep | Good | Average | Less than average | Poor

5. Achievement on the Challenges (tick all boxes that apply)

☐ Balancing Segway | ☐ Dancing Only | ☐ PID motor control | ☐ LED or IMU motor | ☐ None

Grade on Challenges: _____

Students have returned their Lab Kit: **YES** ☐ **NOT YET** ☐

FEEDBACK TO STUDENT: