Project Logbook

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Contents

Semester 1

Week 1 – 01/03 Hours: 14

Week Objective

Decide on project. Obtain approval for combined BCIS/BEng project. Begin market research.

Monday

Workshop – Introduction to R&D Project. 2

Tuesday

Met with team to discuss project direction. 1

Wednesday

Thursday

MS Teams meeting with Ramesh Lal and team members, discussed the combined Engineering and BCIS project. 1

Friday

BEng project week 1 lecture 1

Started first brew. Whiskey. Learning the Mash process. Notes in Teams. 6

Saturday

Starting fermentation after letting wort cool overnight. Notes in Teams. 2

Sunday

Filling out logbook and general admin. 1

Week 2 – 08/03 Hours: 12

Week Objective

Finish BEng project proposal. Kick off meeting.

Monday

Workshop. 2

Tuesday

Three of us met with a mate who has worked on similar projects before. Discussed interfacing between phone and micros. Talked about Xamarin. 2

Wednesday

Kick off meeting. Notes in teams. 1

Thursday

Work on Project Proposal. 2

Friday

Parts research. 4

Saturday

Sunday

Filling out logbook and general admin. 1

Week 3 – 15/03 Hours: 26

Week Objective

Submit project proposal.

Monday

Workshop.	2
Finish proposal and submit.	2
Prototyping Arduino.	2

Tuesday

Prototyping Arduino preparation for tomorrows distilling. Measuring water flow rate, manual adjustment. Notes in Teams.	3
Started second brew, Stout. Notes in Teams. In between steps researched heating elements.	6

Wednesday

Distilling first brew. Only managed to get stripping run done. Notes in Teams.	6

Thursday

Finished the Spirits run from yesterday.	4

Friday

Saturday

Sunday

Filling out logbook and general admin.	1

Week 4 – 22/03 Hours: 8

Week Objective

Continue research into existing products.

Monday

Workshop	2

Tuesday

Blended spirits from stripping run. About 4L yield.	2

Wednesday

Research into existing market products. Notes in Teams.	3

Thursday

Friday

Saturday

Sunday

Filling out logbook and general admin.	1

Break Week 1 – 29/03 Hours: 5

Week Objective

Complete third research brew.

Monday

Tuesday

Third Brew, Bourbon. Notes in Teams. 5

Wednesday

Thursday

Friday

Saturday

Sunday

Break Week 2 – 05/04 Hours: 0

Week Objective

Monday

Tuesday

Wednesday

Thursday

Friday

Saturday

Sunday

Week 5 – 12/04 Hours: 19

Week Objective

Start parts research and ordering.

Monday

Workshop. 2

Tuesday

Research PWM voltage regulators. 4

Ordered parts from Ali Express. 2

Wednesday

Thursday

Friday

Saturday

Sunday

Filling out logbook and general admin. 1

Week 6 – 19/04 Hours: 6

Week Objective

Another brew for research purposes. Research into components.

Monday

Workshop 2

Brew 4, Neutral spirit TPW. Notes in Teams. 3

Tuesday

Wednesday

Thursday

Friday

Saturday

Sunday

Filling out logbook and general admin. 1

Week 7 – 26/04 Hours: 19

Week Objective

Prototype circuit for distilling fourth brew. Continue parts research.

Monday

Workshop 2

Build voltage regulator to trial tomorrow, reduce voltage to element. 4

Tuesday

Distilling Brew 5. 6

Wednesday

Researched and ordered more parts, Ali Express and Trademe. ESP32. 5

Thursday

Friday

Team meeting at AUT. Met lab technician Justin. 1

Saturday

Sunday

Filling out logbook and general admin. 1

Week 8 – 03/05 Hours: 10

Week Objective

Fifth research brew and experimentation.

Monday

Workshop 2

Tuesday

Wednesday

Thursday

Friday

Brew 5, IPA. This brew we borrowed a semi-automated system RoboBrew. Notes in Teams. 5

Carried out in-line water heating experiment. 2

Saturday

Sunday

Filling out logbook and general admin. 1

Week 9 – 10/05 Hours: 15

Week Objective

Start to establish requirements based on research so far.

Monday

Workshop 2

Tuesday

Wednesday

System diagram and software requirements. 6

Thursday

Market research – Brewpi. 6

Friday

Saturday

Sunday

Filling out logbook and general admin. 1

Week 10 – 17/05 Hours: 10

Week Objective

Work on project proposal and status report.

Monday

Workshop 2

Tuesday

Project proposal and status report. 4

Wednesday

Thursday

Project proposal and status report. 3

Friday

Saturday

Sunday

Filling out logbook and general admin. 1

Week 11 – 24/05 Hours: 12

Week Objective

Finish project proposal and status report. Midterm review.

Monday

Workshop 2

Prototype automated 3-way valve. ¼" L type valve so 90° turn. MG995 servo. Drilled and nailed to existing handle but will need to 3d print a housing, quite a bit of torque required to turn. Set up very basic code with Arduino to operate valve, seems onboard 5v not quite enough (450mA) but when using external power 5v (> 650mA) was able to operate smoothly. 4

Tuesday

Wednesday

Thursday

Status Report 3

Friday

Midterm review 2

Saturday

Sunday

Filling out logbook and general admin. 1

Week 12 – 31/05 Hours: 16

Week Objective

Continue servo valve prototyping. Finalise requirements in preparation for app development.

Monday

Servo valve 3d design. 3

Tuesday

Wednesday

System diagram and software requirements. 6

Thursday

Further market/component research. 6

Friday

Saturday

Sunday

Filling out logbook and general admin. 1

Week 13 – 07/06 Hours: 23

Week Objective

Research and order flow meters. Continue testing and refining servo valve.

Monday

Tuesday

Researched flow meters: Food safe flow meter, hard to find as most have plastic components, ideally need SS; Coriolis flow meter, accurate; Ultrasonic flow meter. Impeller might not be ideal, not so accurate roughly 3-10% probably not reliable. differential pressure. Accurate; Magnetic meters. More notes in Teams 6

Wednesday

Thursday

Servo 3-way valve 3d design, 1/4" like 8 hours of work. 8

Friday

Servo 3-way valve 3d design, 1/4". 4

Research into spray nozzle for sparging, 1-2mm orifice. Atomiser nozzle. Spiral jet nozzle. Notes in Teams. 4

Saturday

Sunday

Filling out logbook and general admin. 1

Week 14 – 14/06 Hours: 9

Week Objective

Micro code. Research into interface between the web-app and micro.

Monday

Tuesday

Research into communicating with micro, maybe JSON best bet using Wi-Fi, Bluetooth might not be reliable enough in household. Do we want the ability to update the code over Wi-Fi e.g., for updates to the consumer? More notes in Teams. 4

Wednesday

Thursday

Testing PWM of servos. Ordering new servos, some continuous. Continue flow meter research. 4

Friday

Saturday

Sunday

Filling out logbook and general admin. 1

Inter-Semester Break

Week 1 – 21/06 Hours: 0

Week Objective

Monday

Tuesday

Wednesday

Thursday

Friday

Saturday

Sunday

Week 2 – 28/06 Hours: 5

Week Objective

General research and ordering of parts.

Monday

Tuesday

Spiral nozzle and flow meter. Finally ordered spray nozzle, full cone 0.8mm. Whirl jet nozzles were expensive. 4

Wednesday

Thursday

Friday

Saturday

Sunday

Filling out logbook and general admin. 1

Week 3 – 05/07 Hours: 9

Week Objective

General research and ordering of parts.

Monday

Ordered flow meters. 2

Tuesday

Wednesday

Thursday

Research ESP32 Wi-Fi and Bluetooth, ESP32 web server, REST API. Notes in Teams. 6

Friday

Saturday

Sunday

Filling out logbook and general admin. 1

Semester 2

Week 1 – 12/07 Hours: 32

Week Objective

Research into hardware components and PCB design. Start on Micro code.

Monday

Hardware design, earthing considerations element and pump through 3 pin plugs, plumbing external and connected via weatherproof 3 pin plugs. 4

Tuesday

Spent couple hours trying to track packages from Ali Express, made spreadsheet. 2

Wednesday

Thursday

Researching power supply with Boonie, 6A at 5V required. 230ac-12vdc transformer, 12-5v dc-dc converter at least 30W. 4n25 optocouplers not enough CSR to drive relay, change to bit perhaps. 12v-5vdc switch mode psu, 6A https://nz.rs-online.com/web/p/non-isolated-dc-dc-converters/1359162 or https://nz.rs-online.com/web/p/non-isolated-dc-dc-converters/1834395. More notes in Teams.

MP-LDE45-20B05 is a 5v ac-dc converter. 4

rotary encoder needed for servo needle valve, hollow type such as SRGPWJ0200. absolute vs incremental? 2

hollow threaded rod for temp probes. How to get probes into the pipe? bolt, drill 6mm hole? solder onto probe, 6mm hole in pipe with nut soldered 2

Friday

Workshop 2

Set up esp32 in VS Code, esp-idf. espressif website. Set up cpp properties. Maybe look at using platformIO? 5

Saturday

Physical test assembly of Brew Buddy. Issues with orifice size of valves restricting flow rate. Good days' worth with the other two at my place. 10

Sunday

Filling out logbook and general admin. 1

Week 2 – 19/07 Hours: 21

Week Objective

Work on valve issue from Saturday. Power board design of PCB.

Monday

Tuesday

Testing bigger valve with servo - no good, need bigger servos.	4

Wednesday

Going over power board components. Research into choke selection for ac-dc converter.	5

Thursday

Friday

Workshop	2
Resolving valve and servo issues. 3d prints etc.	3

Saturday

Resolving valve and servo issues. 3d prints etc.	4

Sunday

Filling out logbook and general admin.	1
Resolving valve and servo issues. 3d prints etc.	2

Week 3 – 26/07 Hours: 21

Week Objective

Continue servo valve development. Start Altium PCB design.

Monday

resolving valve and servo issues. 3d prints etc.	4

Tuesday

resolving valve and servo issues. 3d prints etc.	4

Wednesday

resolving valve and servo issues. 3d prints etc.	4

Thursday

Friday

spent all day at Boonies working on Altium, component selection and PCB design	8

Saturday

Sunday

Filling out logbook and general admin.	1

Week 4 – 02/08 Hours: 29

Week Objective

PCB design. Servo valve v2.0 with gearbox.

Monday

Heatsink sizing, PCB track width calculations, Altium trace routing. 6

Tuesday

Mike and Boonie over, ordering parts, PCB track width, one PCB vs two. 5

Wednesday

Valve gearbox issue, servos not strong enough. 2

Thursday

Design and print new gearbox. Gear ratio calculations. 4

Friday

Workshop 2

Design and print new gearbox. 3

Saturday

Design and print new gearbox. 4

Sunday

Filling out logbook and general admin. 1

Order new 35kg servos 2

Week 5 – 09/08 Hours: 29

Week Objective

PCB design.

Monday

Research high voltage requirements for PCB - ipc-2221, IEC-60950-1. PCB line track spacing and track size. Trace width of 200mil (roughly 5mm) external allows for a 16.5 ° temp rise. double sided track of 125mil would give 250mil total.

The trace width is calculated as follows:

First, the Area is calculated:

Area[mils^2] = (Current [Amps]/(k*(Temp_Rise[deg. C])^b))^(1/c)

Then, the Width is calculated:

Width[mils] = Area[mils^2]/(Thickness[oz]*1.378[mils/oz])

For IPC-2221 internal layers: k = 0.024, b = 0.44, c = 0.725

where k, b, and c are constants resulting from curve fitting to the IPC-2221 curves

Mains connector pads are currently about 45mil apart, on the low end might change pad size to 125mil to give 70mil.

3W rule not needed, crosstalk not applicable for power.

325v is peak, 60950-1 table 5b, 330vpeak = 1435v rms test voltage. 1435* sqrt 2 = 2029vpeak. 40mil/v rule = 2029/40 = 50.7mil track width.

65mil track spacing.

Secondary AC, up to 65W pump at 240V is 0.27 amp, size track for 1amp. DC reg input is 0.75A, size for 1amp also

1amp track width about 5mil, keep as 10mil. Could go 20 as there is enough room.

Full notes recorded in Teams. 8

Tuesday

PCB design, research EMI requirements. Separate DC and AC circuits, join grounds? AC earth ground plane? DC Ground plane? Reassign esp32 pins, which ones to use for GPIO?

R5 can't be surface mount? can't get AC isolation width. same for R6 8

Wednesday

PCB queries discussed with Achala Perera (DTA colleague and ex AUT instructor, was going to electrically certify device) see notes in Teams. AC High current track width to be 500mil as only 1oz copper for board.

High current tracks bottom fill exposed for soldering. 4

Thursday

Friday

Workshop 2

Saturday

Add BT/WPS button to PCB. Look at which pins on ESP32 are high during boot. Pin 14 going to be a problem as this will turn the heater on during boot. 6

Sunday

Filling out logbook and general admin. 1

Week 6 – 16/08 Hours: 35

Week Objective

Modify PCB design according to last weeks findings. Start back-end development.

Monday

Rerouting PCB pins based on esp32 boot state. PWM outputs need to be swapped to other pins. Valves may have PWM at boot so possibly move but not an issue. Valve 4 moved from pin 0 to pin 2. 6

Tuesday

Wednesday

Back-end development. esp32 wifi, wps etc. web server. 5

Thursday

Back-end development. esp32 wifi, wps etc. web server. 6

Friday

Workshop 2

Changes to PCB from Justin's (electronics lab tech) feedback. 2

Help Mike and Boonie set up the esp32 and esp-idf in VS Code32. Testing code wps, web server etc 4

LED function for bt/wps. 2

Saturday

ESp32 code, button interrupts with debouncing. 3

Ordering PCB parts through AUT system, ordered wrong resistors had to find replacement in 2010 package not 1206. 4

Sunday

Filling out logbook and general admin. 1

Week 7 – 23/08 Hours: 40

Week Objective

Finish PCB parts order. Continue back-end development. Start research into front-end development.

Monday

Correspondence with Justin, finishing parts order, connectors, wires etc. sorting out PCB order. 2

Tuesday

Research for web server protocols, coap, restful, mqtt. Notes in Teams. 4

Wednesday

Correspondence with Jeff and Justin re parts. Order sockets from Jaycar. GPIO 26 and 25 are DAC. esp_timer at boot. esp_timer_get_time(). 2

Web app, http server hosted on the esp32. benefit of this is that the device will keep running when the app is closed, rather than running it from the app itself. local host is better vs online because we don't want to encourage control/access from outside the area and allows it to be used without an internet connection (still need a router), possibly in future look at an option to make the esp32 the WAP so router is no longer needed for those wanting to operate offline. Hopefully will get to creating a cross platform app that runs the web app, and push notifications but in the meantime the device will pause at a point of notification and wait for the user to open the app again if it is closed, if app is still open it will send the info. 4

Thursday

Research into front-end development. vue? react? esp32 server backend 4

Friday

Workshop 2

web app -> mobile app. Just use bootstrap with jQuery?

Vue.js extension for VScode, lint allows syntax error checking etc. for Vue files.

Vue extension for google chrome dev tools.

https://vuejs.org/v2/guide/ 8

Saturday

App layout design, deploying Vue app. Creating android app from web app. 3

Future dev ideas:

esp32 has access to internet, can have recipes on external server that it can access via app and add to recipes, create an account with login (stored on external database) to create a community where users can share recipes. 1

Vue or react? Vue capacitor, react native. Adobe xd mockup, fireblade can export react? 4

Sunday

Filling out logbook and general admin. 1

Currently recipes saved onboard memory, depending on size of flash in future move recipes to online. Configuring esp32 storage for variables, wifi ssid pw etc. add REQUIRES to components cmakelist when necessary, causing file not found bug. Functions for reading and writing to NVS complete. 5

Break Week 1 – 30/08 Hours: 20

Week Objective

Esp32 Micro development, start work on logic algorithms.

Monday

Esp32 logic block diagram, modelling needle valve bracket. 4

Tuesday

Wednesday

Team meeting about temp probe and brew config logic. Boonie to do config and recipe logic diagram. Sam to set up GitHub. Soldering PCB at home due to COVID-19. 6

Thursday

Interrupts research. read/write NVS blocks interrupts? ESP_INTR_FLAG_IRAM for frequent interrupts? 3

Friday

Saturday

Sunday

Filling out logbook and general admin. 1

ESLint for JS, Vuetify. 1

3d model enclosure. 5

Break Week 2 – 06/09 Hours: 25

Week Objective

Set up GitHub. Front-end development and app mock-up.

Monday

Set up GitHub. 2

Tuesday

GitHub, settings config, coding. Work on manual config page 5

Wednesday

GitHub, settings config, coding. Work on manual config page 6

Thursday

Need to add heater power level to manual page. 2

Started app mock-up. 4

Friday

Saturday

Work on mock-up. 3

Sunday

Filling out logbook and general admin. 1

Finish mock-up. 2

Week 8 – 13/09 Hours: 28

Week Objective

Continue front-end development, page layout IAW mock-up.

Monday

Continuing manual page dev. 3

Tuesday

Servo valves modelling. 2

App structure IAW mock-up. 2

Wednesday

Servo valves modelling. 2

App structure IAW mock-up. 2

Input fields validation, input form vs text field, use something like vee validate? Inputs are mostly ints and nothing complicated so don't need rules. 2

Thursday

Error mounting SPIFFS, image exceed memory. Need to increase www/ partition from 2M to 4M, and increase serial flash size in SDK config? Esp32 only has 4mb of flash available. Vue front end js approaching 2mb. Changed the structure so the frontend, is now hosted on my web server acting as a CDN and only index is flashed to SPIFFS, index now uses absolute html reference to web server. Downside to this is Brew Buddy is no longer offline, and also now a longer process for development. This is possibly short-term fix for sake of the project, and long term may look at adding SD card functionality instead. 6

Pain to upload files every time I run npm build, as the file names change. Also don't have JTAG so can't semi host from pc. Will continue to develop in parts using esp flash and then upload to CDN for deployment. Actually, will be a combination of both as assets can go straight to CDN as they don't change.

To swap between two just change the web src file in main makefile and rest_server makelist 1

Friday

Workshop 2

Valve servo function. 3

Saturday

Valve servo function. 2

Sunday

Filling out logbook and general admin. 1

Week 9 – 20/09 Hours: 35

Week Objective

Esp micro code. Continue front-end dev.

Monday

Teams meeting with Boonie and Mike, merge various branches. 4

NVS functions storing brew setup and recipe info. 2

Tuesday

NVS functions storing brew setup and recipe info. 3

Wednesday

Upgrade Vue1.5x to 2.5x bout a days work, but best to do it now rather than later. 4

Thursday

Upgrade Vue1.5x to 2,5x bout a days work, but best to do it now rather than later. 4

Friday

Workshop 2

Converting code to Vue2.5. Having issue with Vue checkbox after upgrading might have to look at something outside vuetify. 3

Bit of 3d printing etc. 3

Saturday

Converting code to Vue2.5. Having issue with Vue checkbox after upgrading might have to look at something outside vuetify. 3

Sunday

Filling out logbook and general admin. 1

Converting code to Vue2.5. Having issue with Vue checkbox after upgrading might have to look at something outside vuetify.

Ended up having to use custom icon for vuetify checkbox something not working properly.

Look at updating row/cols to flex containers for better look on small screens.

Using v-slot:append to line up text fields with sliders.

Issue with input spin buttons not showing up. 6

Week 10 – 27/09 Hours: 45

Week Objective

Recipe storage, front, back, as well as micro code.

Monday

Data table for recipe list

Variation of book page, if brew in progress, then brew button disabled e.g., if getting there from brew page (which you can't if brew in progress) then brew button is shown, but if getting there from home then brew button is disabled. Figured out how to use props to pass fromBrew or fromHome to book page to achieve this, rather than using two Vue pages.

Storing recipes in NVS:

OPTION 1 - Each recipe is its own namespace 'name' and key-value for values e.g., namespace "sam recipe" key: “grain weight” value: “10”. how to get all recipes as a list, perhaps a RECIPES namespace with key-recipe names and value - json string of all recipe’s names? recipe names match with recipe namespaces. blob - read table to populate data table, new/edit will.

OPTION 2- Store as JSON strings with recipe name as key, and just one namespace of RECIPES - need to be able to get all keys from NVSs though.

OPTION 3 - Store all recipes as a blob, all data of all recipes loaded on recipe book page, any edit/delete/new will re-write entire blob to NVS. Then when starting brew will need to pass all recipe info to esp32 as it won’t be able to get from NVS. This option probably best so it doesn’t need to load a new namespace every time you view or edit recipe.

blob structure example:

key: “recipe list”

value: '[{name: 'Sam’s Recipe 1', weight: 10, watervolume: 20, },{ name: 'Sams Recipe 2', weight: 10, watervolume: 20 }]'

Reach max number of URI handlers, need to figure out how to increase this on the esp32 server

Rest_server.c -> start_rest_server:

httpd_handle_t server = NULL;

```
httpd_config_t config = HTTPD_DEFAULT_CONFIG();

config.max_uri_handlers = 20;

config.uri_match_fn = httpd_uri_match_wildcard;
```

Error: ESP_ERR_NVS_NOT_FOUND trying to load recipelist -> had to change all NVS keys to under 15 characters

Recipe book data table has a few bugs, notably when clicking off the dialog to close it instead of pressing close it buggers up opening a new dialog, get around by clicking between table icons and new recipe - > ended up fixing this, was an issue with the pop-up dialog.

how to convert list string back to list cJSON. 10

Tuesday

Continue from yesterday.

Had to disable mobile break point for data table.

Use Vue store to pass JSON string of selected recipe to the brew page 8

Wednesday

5 hour meeting with Boonie and Mike, going through some of the server to micro integration. 5

For sparge stages and adjuncts, created a data table with inline editable fields using v-slots. Nested data table inside v-dialog :items="editedItem.mashstages"

Currently fixed table of 5 to fit in with micro code.

Look at putting brewery setup on store to reduce load times, same with recipe list though that gets changed often. 5

Thursday

Working on the flow meter code. 4

Friday

Workshop 2

Working on the flow meter code. 3

Saturday

Data validation for recipe, number fields to number only and recipe title required. 5

Sunday

Filling out logbook and general admin. 1

Is the issue with different address of static structs due to inclusion of headers? Headers not containing if not define will then define a static struct for each file including that header, rather than one central one. 2

Week 11 – 04/10 Hours: 25

Week Objective

Finish functional front-end. Integrate code and test.

Monday

Finish brew progress page. Join minutes and seconds to one text field with return `${this.$store.state.minutesremaining} : ${this.$store.state.secondsremaining}` 4

Using append outer made status icon not line up properly so ended up using row-col-row with padding.

Conditionally rendered divs to make my own text area that allows for different coloured lines. tried v-virtual scroll but required fixed item height, went with v-sheet and v-card with scroll as an infinite scroll is not necessary, the list of text lines won't be that long for a brew. 2

Timertesttask() created in main for testing brew progress timer 1

Tuesday

Does brewery setup need to be disabled during a brew or does it not matter if the setup is changed during brew. Scroll to bottom of text area working when a new message is received by adding watcher to text area. Also added scrollbottom function to mounted so it would go to bottom on loading progress page. 2

Various online meetings with team integrating the micro code with the server and frontend. Project update emails etc. 2

Wednesday

Various online meetings with team integrating the micro code with the server and frontend. Project update emails etc. 3

Thursday

Various online meetings with team integrating the micro code with the server and frontend. Project update emails etc. 2

Friday

Workshop 2

Various online meetings with team integrating the micro code with the server and frontend. Project update emails etc. 2

Saturday

Various online meetings with team integrating the micro code with the server and frontend. Project update emails etc. 3

Sunday

Filling out logbook and general admin. 1

Should add a debounce to manual page so it's not sending api request every click. setTimeout and clearTimeout. 1

Week 12 – 11/10 Hours: 13

Week Objective

Finish code integration, bug fixes.

Monday

Frontend micro integration. 4

Tuesday

Frontend micro integration. 4

Meeting with team, project update, demonstration. 2

Wednesday

Thursday

Friday

Workshop 2

Saturday

Sunday

Filling out logbook and general admin. 1

Week 13 – 18/10 Hours: 20

Week Objective

PCB enclosure. System assembly. Preparation for testing and demonstration video.

Monday

Enclosure modelling and printing. 4

Tuesday

Enclosure modelling and printing. 4

Wednesday

Testing PCB. 3

Thursday

Friday

Boonie and Mike over to build and test loop, will video on Tuesday. About 7.5 hours 8

Saturday

Sunday

Filling out logbook and general admin. 1

Week 14 – 25/10 Hours: 44

Week Objective

Demonstration video. Project poster presentation.

Monday

Tuesday

Video Demonstration with Boonie and Mike. Various bug fixing of code. 12

Wednesday

Poster and project report. 8

Thursday

Poster. 6

Friday

Brew Buddy BCIS Poster Presentation and Demonstration. 1

Saturday

Project report 8

Poster amendments and email to Karen. 2

Sunday

Filling out logbook and general admin. 1

Project report. 6

Week 15 – 01/11 Hours: 13

Week Objective

Submit BEng project report. Work on BCIS portfolio and Reflective Report.

Monday

Project report. Submitted. 6

Tuesday

Wednesday

Thursday

Start draft of Reflective Report. 2

Friday

Reflective Report and Portfolio organisation. 4

Saturday

Sunday

Filling out logbook and general admin. 1

Week 16 – 08/11 Hours: 34

Week Objective

Finish and submit Reflective Report and Project Portfolio.

Monday

Tuesday

Reflective Report and Project Portfolio. 5

Wednesday

Tidy GitHub branches and code. 4

Reflective Report and Project Portfolio. 4

Thursday

Reflective Report and Project Portfolio. 5

Friday

Saturday

Finish Reflective Report. 10

Sunday

Finish Project Portfolio. 4

Reflective Report and Project Portfolio, submitted. 2