University of BRISTOL

AVDASI2 2023-24 Unit Planning

Team Meeting 29th June 2023

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Intended Learning Outcomes & Assessment (Reminder)

Your learning on this unit

On successful completion of the unit the student will be able to:

1. carry out the design, build and test of a functioning major UAV assembly as part of a team, using applicable interdisciplinary concepts and methods;
2. work as a member of a team, employing appropriate project management and planning tools to create, monitor and deliver a project plan;
3. utilise introspective and reflective methods to identify opportunities for enhanced individual and team performance in future projects;
4. discuss key health and safety responsibilities for engineers; and using recognised risk management tools create risk assessments to analyse a variety of project risks;
5. communicate technical information via written documents and presentations; and utilise feedback given to establish improvements in successive presentations.

(Only specific skills listed are in the domain of Professional Practice)

How you will be assessed

[50%] – group technical report (ILO 1,2,4,5)

[20%] – group FDR presentation (ILO 2,3,4,5)

[30%] – individual reflective portfolio (ILO 2,3)

(No exam)

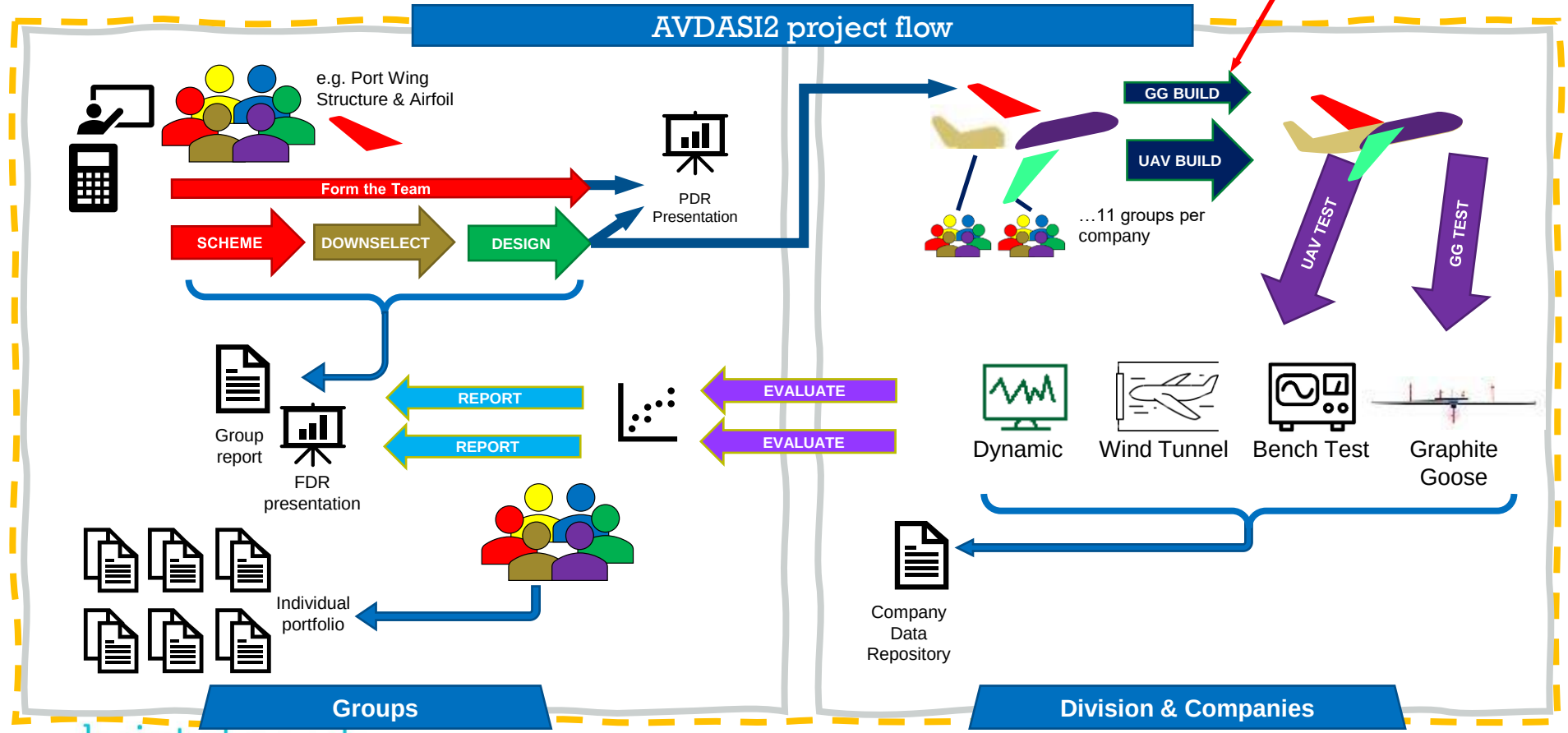
Summative assessment deliverables currently:

- Group Report – wk22
- FDR – wk22
- Reflection – wk23

(Bump report / Reflection back by 1 week?)

Group to Company

Group contribution to GG unclear



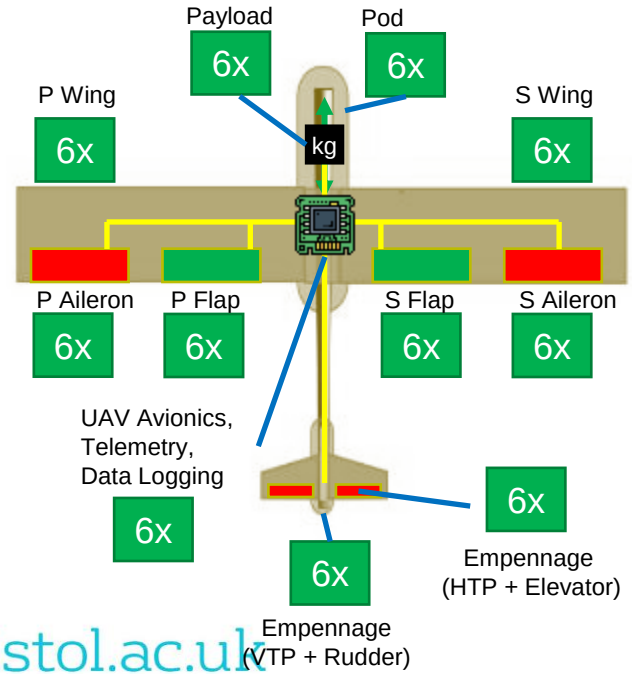
Reminder – no exam this year.

23-24 Cohort

Unit = 132 students (projected)

Company A

66 students. 11 Groups of 6x



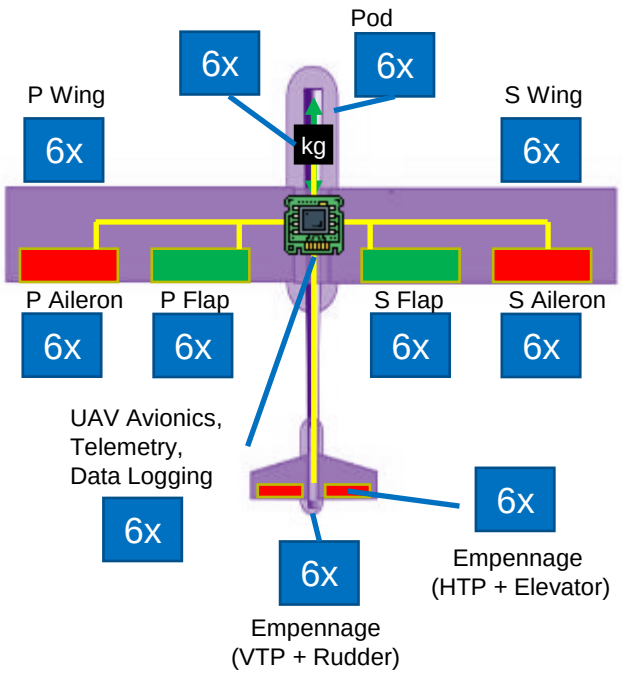
UAV Flying is not targeted/planned.

Therefore P/S wing design symmetry not necessary.

Asymmetry permits increased autonomy/ownership.

Company B

66 students. 11 Groups of 6x



Individual specialist roles in groups

	Essential	Specialism 1	Specialism 2	Optional
Role 1 'Aerodynamics'	Manufacture/ Build/ Test	**Aerodynamics**		Company Leadership & Administration Roles
Role 2 'Structures'		**Structures**		
Role 3 'Avionics and Control'		Aero / Struct	**Avionics & Control**	
Role 4 'Project Management'		Aero / Struct	**Project Management**	
Role 5 'Design'		Aero / Struct	**CAD/Drafting/BOM**	
Role 6 'Risk & Quality Management'		Aero / Struct	**Risk and Quality Management**	

- Nominally groups of 6x
- ***Everyone*** engages with manufacturing and build
- Students will decide Division/Company leadership/admin roles
  - Removing initial design sprint will facilitate more time/focus for that

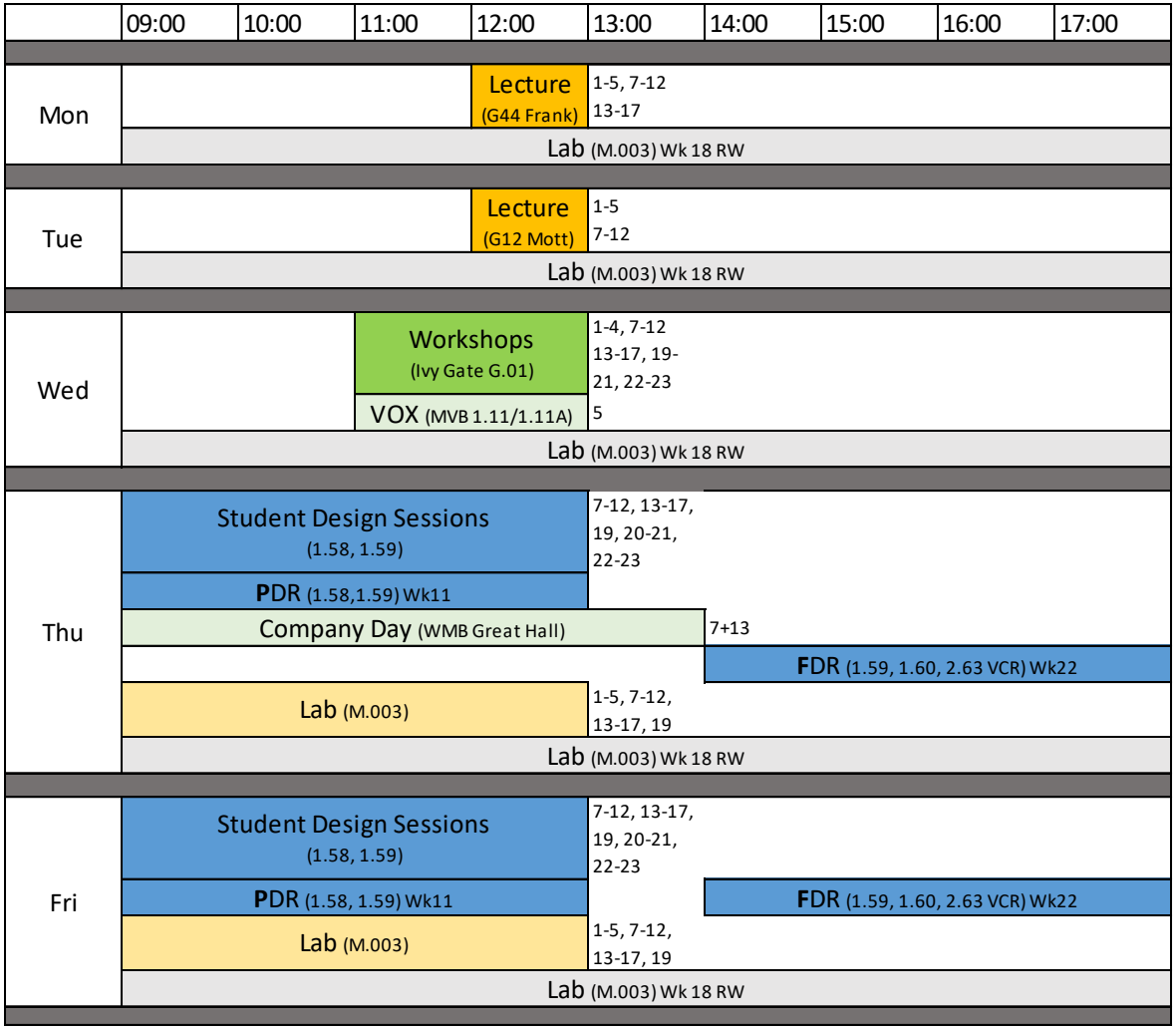
Specialisms vs group

- Much more Avionics content/focus compared to previous
- The *specialism* is a part of the individual's role, but there are still many core responsibilities

Division	Co. A	Co. B	Sub-assembly	Total	Aerodynamics	Structures	Avionics & MAC	Design & Dynamics	Project Management	Risk and Quality Management
Port Wing	1	11	P Wing & Airfoil	6	1.5	1.5		1	1	1
	2	12	P Flap (inc MAC/Avionics)	6	1		2	1	1	1
	3	13	P Aileron (inc MAC/Avionics)	6	1		2	1	1	1
Starboard Wing	4	14	S Wing & Airfoil	6	1.5	1.5	0	1	1	1
	5	15	S Flap (inc MAC/Avionics)	6	1		2	1	1	1
	6	16	S Aileron (inc MAC/Avionics)	6	1		2	1	1	1
UAV Avionics	7	17	UAV Avionics, Telemetry and Data Logging	6			3	1	1	1
Fuselage	8	18	Pod	6		3		1	1	1
	9	19	Empennage - VTP & Rudder	6	2		1	1	1	1
	10	20	Empennage - HTP & Elevator	6	2		1	1	1	1
	11	21	Payload	6			3	1	1	1
Company totals					11	6	16	11	11	11
Unit totals					22	12	32	22	22	22

Timetable

- Workshops are a mixture of active teaching and group work
- Wed PM lab sessions?
- 2 company days booked
- PDR/FDR booked
- VOX booked
- Wk18 lab as overspill, not intent?



Lecture map

- TB1 (pre RW) = 15 hrs
- TB1 (post RW) = 15 hrs
- TB2 (pre RW) = 10 hrs
- TB2 (pre Easter) = 3 hrs
- TB2 (post Easter) = Drop-ins only

Mark Graham	Mark Graham	Ian Farrow	Tom Rendall	Nick Zang	Fred Paulino	Brano Titurus	Matt Richardson	Mark?
1	10	5	3	2	4	2	3	2
Unit Intro	Team Development	Structures intro	Aero intro	Wind tunnels	Sensors	Dynamics 1	Labs intro	Design documentatio
	Down-selection	Loads	Wing	Data post-processing	ADC's	Dynamics 2	Prototype to product	Manufacturing ability
	Project Planning 1	Spars	Tailplane		Mechanisms		Tech Hub Intro?	
	Project Planning 2	Ribs			Actuators			
		Joints						
	VOX							
	Risk Mgt 1							
	Risk Mgt 2							
	Reflective Practive							
	DFMEA workshop							
	Working across							

43 hrs teaching time
Might need to use 1.58/1.59 (during student design sessions)
for specialist teaching.

32 hrs

Lecture map

- TB1 (pre RW) = 15 hrs
- TB1 (post RW) = 15 hrs
- TB2 (pre RW) = 10 hrs
- TB2 (pre Easter) = 3 hrs
- TB2 (post Easter) = Drop-ins only

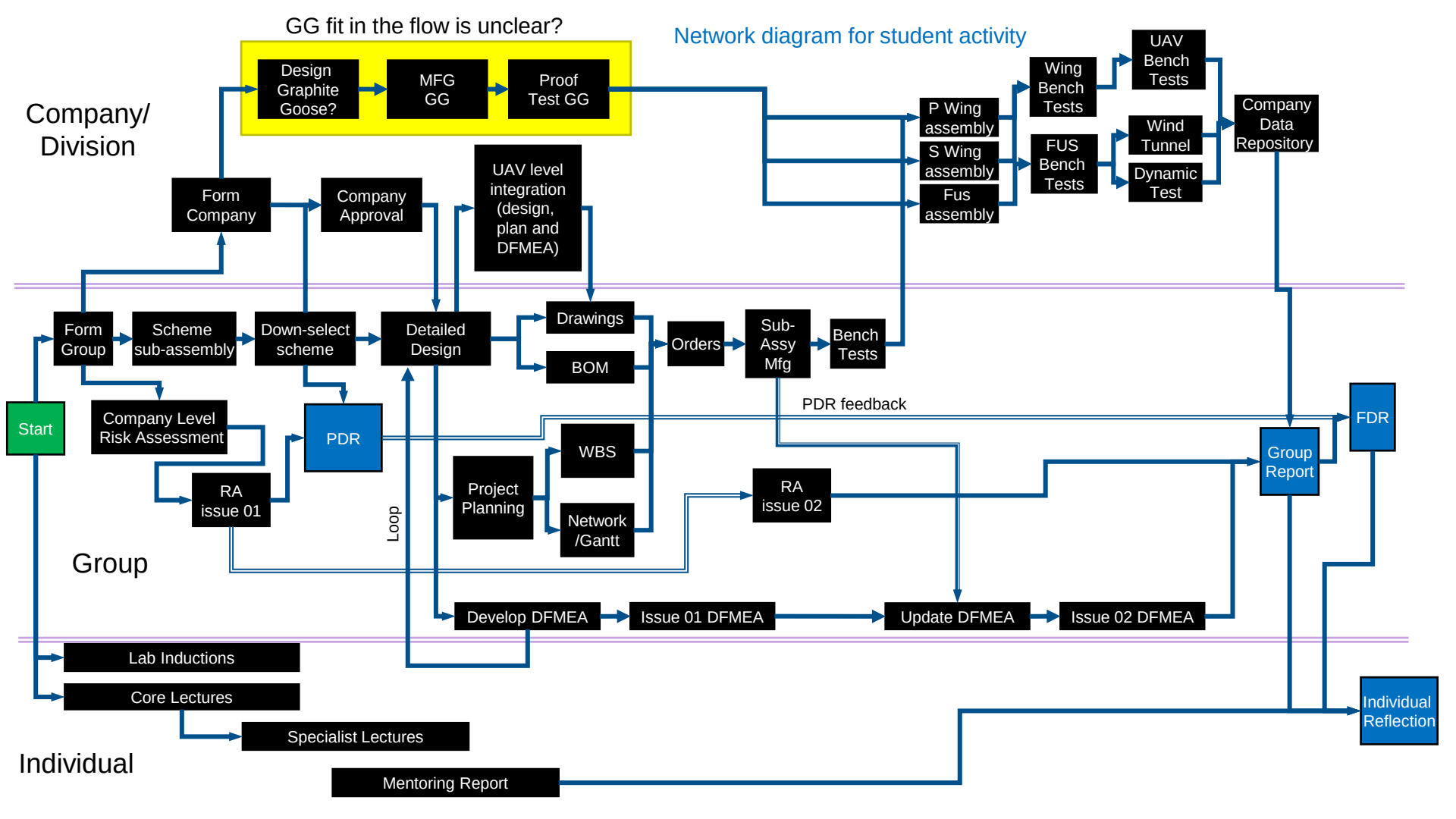
43 hrs teaching time
Might need to use 1.58/1.59 (during student design sessions)
for specialist teaching.

Location	G44 Frank	G12 Mott	Ivy Gate G.01	
wk1	Unit Intro	Structures intro	Team Development	- Ice Breaking - Team Charter - Goal setting
wk2	Aero intro	Avionics & MAC Intro	Down-selection	- Choose Specialism - Meet mentor
wk3			Project Planning 1	
wk4			Project Planning 2	
wk5			VOX (MVB)	
wk6	RW	RW	RW	RW
wk7			Risk Mgt 1	
wk8			Risk Mgt 2	
wk9			DFMEA workshop	
wk10				
wk11				
wk12				
	XMAS			
wk13				
wk14				
wk15				
wk16				
wk17			Reflective Practice	
wk18	RW	RW	RW	RW
wk19				
wk20				
wk21				
	Easter			
wk22			Optional Drop-in	
wk23			Optional Drop-in	
wk24				

- Slides not presented (we ran out of time), but might useful for reference

Specialisms – Approach to teaching

- Within each teaching stream lectures are identified as ***core*** or ***specialist***
- Attendance to ***core*** lectures is mandatory for all students
- Specialist attend ***specialist*** lectures. Others can attend also (space providing).
- Smaller group sizes permit flexibility on rooms (i.e. could use timetables 1.58/1.59 slots)
- Definitive Unit ILOs only relate to PP skills


GG fit in the flow is unclear?
Network diagram for student activity
Company/ Division
Design Graphite Goose?
MFG GG
Proof Test GG
Form Company
Company Approval
UAV level integration (design, plan and DFMEA)
P Wing assembly
S Wing assembly
Fus assembly
Wing Bench Tests
FUS Bench Tests
UAV Bench Tests
Wind Tunnel
Dynamic Test
Company Data Repository
Form Group
Scheme sub-assembly
Down-select scheme
Detailed Design
Drawings
BOM
Orders
Sub-Assy Mfg
Bench Tests
Start
Company Level Risk Assessment
PDR
PDR feedback
FDR
RA issue 01
Loop
Project Planning
WBS
Network /Gantt
RA issue 02
Group Report
Group
Develop DFMEA
Issue 01 DFMEA
Update DFMEA
Issue 02 DFMEA
Lab Inductions
Core Lectures
Specialist Lectures
Individual Reflection
Individual
Mentoring Report

Mentors

- 6x PG staff.. Experienced and trained to do the job.
- 3-4 groups each
- Meeting with group (in Wednesday sessions) every 2-weeks
- 10-15-min check-in per group.
- Mixture of informal observation and specific questions (at specific times in the unit)
- Student Work Breakdown can form part of the review structure (i.e. where are you now on the plan), what should you be doing

Graphite Goose

- Challenge: How can students will equitably contribute to the Graphite Goose?
  - The design is at company level, but only relates to a limited number of features of the UAV, some of which might be fixed to de-risk the design/build sprint
  - The 2022-23 down-selection sprint allowed students to contribute (theoretically), but added risk to the timing
- Can students be given a GG recipe, and focus on MFG trials, build and test at that point instead

Gates

- Set some key project gates
  - Group level
  - Company level

- Define basic Gate review requirements, but allow students to adapt (Brains-on thinking)

- Define Gate review timings to match deliverables

Aerobucks

- Every 2-weeks on the unit, the group members assign bonuses based on individual activities
- Bonuses result in normalised marks for the Group Report/FDR marks
- As marketed as bonuses, then the optics are slightly different (the min weighting will be 1.0)
- Reality is that some students will be in deficit
- Group Mentors will have oversight
- Group tasklist (on teams) will provide a talking point
- Company tasklist will also improve visibility

DALL-e

Core Structures and Aero

- There is now no exam
- Removing the initial design sprint, and specialising groups removes the initial focus (for some) on detailed Structures and Aerodynamics
- Structures and Aero are still needed for the final report gap analysis

- What strengths in Structures/Aero are needed to prepare for Yr3
- How is individual capability ensured?
- FDR Viva questions to the non-experts (poor reliability, high randomness?)