Bachelor of Agricultural Science (Animal Health and Applied Maths & Statistics)

Academic Chairs:

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- Applied Maths and Statistics: Graeme Hocking G.Hocking@murdoch.edu.au

Course Core Units

Students must complete (or be exempt from) the following units: **ANS100, MAS183, CHE140, BIO152**

Note: Students who achieved a final scaled score of 50 percent or more in Chemistry 3A/3B or Chemistry ATAR within the past three years should apply for exemption for CHE140 Fundamentals of Chemistry.

Note: Students commencing pre 2024 that have completed BSC100 have exemption for ANS100.

Animal Health Major

Students must complete the following units: **BMS107, ANS102, VET272, ANS221, ANS313**

plus THREE units from this list: **VET211, VET278, VET380, VET392, ANS300**

Applied Maths and Statistics

Students that have not achieved a final scaled score of 55% or more in ATAR Mathematics Methods (or equivalent) may be required to complete **MAS164**

Required units: **MAS161, MAS183**

Group A – one unit from this list: **MAS162, MAS182**

Group B – one unit from this list: **MAS220, MAS221**

Group C – one unit from this list: **MAS222, MAS223, MAS224**

Group D – one unit from this list: **MAS220, MAS221, MAS222, MAS223, MAS224, MAS225, MAS351, MAS352, MAS353, MAS354**

Group E – 2 units from this list: **MAS351, MAS352, MAS353, MAS354**

Career Learning Spine

Students must complete **THREE** career learning spine units from the approved list:

Highly recommended: ANS301, ANS303, ANS305 (can be repeated for credit), ANS200

Also suitable: ANS302, MSP100, MSP200, MSP201, MSP202, VLS302

General Electives added to bring total credit points to 72 points

Students with exemption for CHE140 should include **ONE** general elective and students with exemption for MAS164 should include ONE general elective.

The timing and type of unit is flexible with only restriction that no more than 30 credit points can come from Part 1 units.

Please note: These course plans are a sample only and must be read in conjunction with the full course structure, unit prerequisites and enrolment options as outlined in the [Handbook](#). Students should note that due to unit prerequisites, commencing study in Semester 2 may extend the duration of the course. This information is correct as at November 2023.

EXAMPLE PLAN 1:

- exemption for CHE140

Start Date: Semester 1 2024

	Semester 1 Units	CP	Semester 2 Units	CP
Year 1 – 2024	**ANS100** Introduction to Agricultural Science	3	**BIO152** Cell Biology	3
	ANS102 Introduction to the Animal Body	3	**BMS107** Foundations of Vertebrate Form & Function	3
	AM&S Pre-req MAS164 Fundamentals of Maths or Elective	3	**AM&S 1: MAS183** Statistical data analysis	3
	AM&S Group A: MAS182 Intro Calc with Applications	3	**AM&S 2: MAS161** Calculus and Matrix Algebra	3
	Winter Units	CP	**Summer Units**	CP
	Total	12	**Total**	12
Year 2 - 2025	**Semester 1 Units**	CP	**Semester 2 Units**	CP
	VET272 Comparative Mammalian Biochemistry	3	**ANS221** Animal Structure and Function	3
	AM&S Group B: MAS220 Math Methods & multivariable calc	3	**AH Specified Elective 1:** VET211 Vet microbiology	3
	AM&S Group D: MAS224 Biostatistics	3	**AH Specified Elective 2:** VET278 Vet parasitology Or **Spine 2**: ANS305 (work placement) or MSP100 or MSP200	3
	Spine 1: ANS305 (work placement) or MSP100, MSP200, MSP202	3	**AM&S Group C:** MAS223 Applied statistics	3
	Winter Units	CP	**Summer Units**	CP
	Total	12	**Total**	12
Year 3 - 2026	**Semester 1 Units**	CP	**Semester 2 Units**	CP
	ANS313 Pathology & Diseases of Production Animals	3	**AH Specified Elective 3:** VET392 One Health or ANS300 Applied Livestock Health Or **Spine 2:** MSP305 (placement) or MSP200, MSP201, MSP202	3
	AM&S Group E 1: MAS351 Environmental and Biological Modelling	3	**AM&S Group E 2:** MAS353 Statistical design and data analysis	3
	AH Specified Elective 3: VET380 Vet Nutrition and Toxicology Or **Spine 2:** MSP305 (placement) or ANS200, MSP200, MSP201, MSP202	3	**Spine 3:** MSP305 (placement) or MSP200, MSP201, MSP202	3
	Elective	3		3
	Winter Units	CP	**Summer Units**	CP
	Total	12	**Total**	12

TOTAL CREDIT POINTS	**72**

EXAMPLE PLAN 2:
- no exemption for CHE140
- requires MAS164

Start Date: Semester 1 2024

	Semester 1 Units	CP	Semester 2 Units	CP
Year 1 – 2024	**ANS100** Introduction to Agricultural Science	3	**CHE140** Fundamentals of Chemistry	3
	ANS102 Introduction to the Animal Body	3	**BMS107** Foundations of Vertebrate Form & Function	3
	AM&S Pre-req MAS164 Fundamentals of Maths or Elective	3	**AM&S 1: MAS183** Statistical data analysis	3
	AM&S Group A: MAS182 Intro Calc with Applications	3	**AM&S 2: MAS161** Calculus and Matrix Algebra	3
	Winter Units	**CP**	**Summer Units**	**CP**
	Total	12	**Total**	12
Year 2 - 2025	**BIO152** Cell Biology	3	**ANS221** Animal Structure and Function	3
	AM&S Group B: MAS220 Math Methods & multivariable calc	3	**AH Specified Elective 1:** VET221 Vet microbiology	3
	AM&S Group D: MAS224 Biostatistics	3	**AH Specified Elective 2:** VET278 Vet parasitology	3
	Spine 1: ANS305 (work placement) or MSP100, MSP200, MSP202	3	**AM&S Group C:** MAS223 Applied statistics	3
	Winter Units	**CP**	**Summer Units**	**CP**
	Total	12	**Total**	12
Year 3 - 2026	**VET272** Comparative Mammalian Biochemistry	3	**AH Specified Elective 3:** VET392 or ANS300	3
	ANS313 Pathology & Diseases of Production Animals	3	**AM&S Group E 2:** MAS353 Statistical design and data analysis	3
	AM&S Group E 1: MAS351 Environmental and Biological Modelling	3	**AH Specified Elective 3:** VET392 One Health	3
	Spine 2: MSP305 (placement) or ANS200, MSP200, MSP201, MSP202	3	**Spine 3:** MSP305 (placement) or MSP200, MSP201, MSP202	3
	Winter Units	**CP**	**Summer Units**	**CP**
	Total	12	**Total**	12

TOTAL CREDIT POINTS	**72**

Pre-requisite checklist

Course Core

Code	Name	Pre-req	Enrolment notes
ANS100	Introduction to Agricultural Science	None	
MAS183	Statistical Data Analysis	None	
CHE140	Fundamentals of Chemistry	None	
BIO152	Cell Biology	CHE140	Recommend completing 12 points prior to enrolment

Major: Animal Health

Code	Name	Pre-req	Enrolment notes
ANS102	Introduction to Animal Body	None	
BMS107	Foundations of Vertebrate Form and Function	None	It is recommended that students complete BMS101 or ANS102 prior to enrolment.
VET272	Veterinary Biochemistry	BIO152	
ANS221	Animal Structure & Function	BIO152 BMS107	
ANS313	Animal Pathology and Diseases	BIO152 ANS221	Recommended complete VET272 Veterinary Biochemistry as background where possible.
VET211	Principles of Infectious Disease I - Veterinary Microbiology	BIO152	
VET278	Principles of Infectious Disease II - Veterinary Parasitology	BIO152	
VET392	One Health	VET375/ANS313 VET272 VET211 VET278	Concurrent enrolment with VET278 considered only under exceptional circumstances
VET380	Veterinary Nutrition & Animal Toxicology	VET272 ANS221	Concurrent enrolment with VET272 considered only under exceptional circumstances
ANS300	Applied Livestock Health Management	ANS101 VET211	Students will need to submit an application for enrolment

Major: Applied Maths and Stats

Code	Name	Pre-req	Enrolment notes
MAS164	Fundamentals of Mathematics	None	Students who have achieved a final scaled score of 55% or more in ATAR Mathematics Specialist, WACE Mathematics Specialist 3C/3D or TEE Calculus may not enrol in this unit. Cannot be taken concurrently with MAS162 or MAS182
MAS161	Calculus and Matrix Algebra	MAS182	A final scaled score of 55% or more in ATAR Mathematics Specialist (or equivalent), or MAS182. Cannot be taken concurrently with MAS182 or MAS164
MAS183	Statistical Data Analysis	None	
MAS162	Discrete Maths and Logic	MAS164/MAS182/MAS161	Students who have not completed the pre-requisite units MAS164 or MAS182 or MAS161 need to have a final scaled score of 55% or more in ATAR Mathematics Applications OR a final scaled score of 50% or more in ATAR Mathematics Methods OR equivalent.
MAS182	Introductory Calculus with Applications		A final scaled score of 55% or more in ATAR Mathematics Methods (or equivalent), or MAS164. Students who have successfully completed a calculus unit of the level of MAS161 Calculus and Matrix Algebra or higher may not enrol in this unit for credit.
MAS220	Mathematical Methods and Multivariable Calculus	MAS208/MAS221/MAS161	Students who have not completed any of the pre-requisite units need to complete equivalent unit before taking this unit.
MAS221	Mathematical Modelling	MAS182/MAS161	Students may not enrol in this unit and MAS164 Fundamentals of Mathematics concurrently.
MAS222	Probability and Statistical Inference	MAS223/MAS224/MAS180/ MAS230/MAS183/MAS284 And MAS182	Students must have a calculus background equivalent to at least MAS182 Applied Mathematics if the pre-requisite MAS182 have not been completed.
MAS223	Applied Statistics	MAS183	
MAS224	Biostatistics	MAS180/MAS183	
MAS225	Optimisation and Graph Theory	MAS162/MAS161/MAS221	
MAS351	Environmental and Biological Modelling	MAS208/MAS220/MAS261/ MAS221	Can't enrol in MAS182, MAS161 or MAS164 concurrently
MAS352	Time Series Analysis	MAS224/MAS222/MAS230/ MAS278/MAS284/MAS223 And MAS208/MAS161/MAS221	Can't enrol in MAS183, MAS180 Student must have a calculus background equivalent to at least either MAS161 Calculus and Matrix Algebra OR MAS221/MAS208 Mathematical Modelling.
MAS353	Statistical Design and Data Analysis	MAS224/MAS222/MAS230/ MAS278/MAS284/MAS223	Cannot do MAS180 or MAS183 concurrently
MAS354	Modelling and Simulation	MAS182 and MAS167 Or MAS162 and MAS182 Or MAS208/MAS221/MAS161	

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Career Learning Spine

Code	Name	Pre-req	Enrolment notes
ANS301	Agricultural Study Tour Opportunities	TBA	Students will need to submit an application for enrolment, please contact Unit Coordinator.
ANS305	Advanced Agricultural Career Skills	ANS100/ANS101 Or ANS101 (2020-22)	Some placements may be available for students that have not completed pre-reqs
ANS200	International Field Work in Agricultural and Environmental Sciences – Thailand	None	Students must have completed 24 credit points before enrolling in this unit
MSP100	Career Learning: Managing Your Career	None	
MSP200	Building Employability Skills	None	
MSP201	Real World Learning	None	Successful completion of 24 credit points.
MSP202	The Search for Everything: Data Analytics and Storytelling in the Twenty-First Century	None	
VLS302	Professional Placement in Environmental and Life Sciences	None	Students must have completed 36 credit points towards their degree Students must have a GPA of 2.0 or higher.

Suggested Electives

Code	Name	Pre-req	Enrolment notes
ANS101	Introduction to Livestock Science & Genetics	None	
ANS363	Applied Animal Agriculture		Should have completed 24 credit points before enrolling in this unit
ANS364	Applied Animal Breeding		Should have completed 24 credit points before enrolling in this unit
ANS365	Equine Physiology & Behaviour	ANS102/BMS107	
ANS366	Equine Health and Performance	None	Prior completion of BMS107 (or equivalent) is recommended, but not essential.
VET380	Veterinary Nutrition & Animal Toxicology	VET272 ANS221	Concurrent enrolment with VET272 considered only under exceptional circumstances
ENV243	Water & Earth Science	None	
ANS207	Crop & Pasture Science	CHE140	
ANS208	Crop Protection & Plant Biosecurity	ANS100	
ANS309	Agricultural Markets, Economics & Policy	None	
ANS311	Agricultural & Environmental Technologies	None	
ANS301	Agricultural Study Tour Opportunities	TBA	Students will need to submit an application for enrolment, please contact Unit Coordinator.
ANS302	Farm Placements	ANS100/ANS101 Or ANS101 (2020-22)	
ANS303	Livestock Industry Career Readiness	ANS333	
ANS305	Advanced Agricultural Career Skills	ANS100/ANS101 Or ANS101 (2020-22)	Some placements may be available for students that have not completed pre-reqs
ANS200	International Field Work in Agricultural and Environmental Sciences – Thailand	None	Students must have completed 24 credit points before enrolling in this unit