MPAS MODULES

Compulsory Courses

BIG DA	BIG DATA AND ARTIFICIAL INTELLIGENCE IN ANIMAL SCIENCE									
Modul	e/Course	Student	Cre	dits Semester		er	Frequency	7	Duration	
Code		workload	3 S(CU	1 st seme	ester	ster Each		1 Semester	
PEF800	002	228 hours					Semesters			
1.	Types of c	ourses		Contact	hours	Inde	dependent		ass size	
	Compulsor	v courses		48 hour	S	stud	V	20)-25 students	
	1					180 i	iours			
						(stru	ctural			
						assig	nment 80			
						hour	s and self			
						learn	ing 100			
						hour	s)			
2.	Prereguisi	tes for participa	ation				5			
	-	···· ··· ··· ··· ··· ··· ··· ···								
3.	Intended	Learning Outc	omes	:						
01	1. Applyi	ng logical, critic	al sv	stematic	and crea	tive th	inking in the	fiel	d of animal	
	husbar	ndry through sc	ientif	ic researc	h and the	e resul	ts of studies	has	ed on rules.	
	proced	ures, and scien	tific e	thics in th	ne form o	fathe	sis (ILO1)	Duo	ea en raies,	
	2. Take d	ecisions in the	conte	xt of reso	lving the	nrohle	em of develor	ning	science and	
	techno	logy based on a	nalvs	sis or expe	erimental	studie	es of informa	tior	n and data	
	(ILO5)		j -							
	3. Have th	he ability to uti	lize ai	oplication	or softw	are in	animal husb	and	rv field	
	(ILO8)			producer						
4.	Subject ain	ns/content								
	This course	e discusses the	appli	cation of a	artificial i	intellig	ence in the l	ives	stock industry	
	and the use	e of big data in	answ	ering the	current a	and fu	ture problem	15.0	f the livestock	
	industry.						P			
5.	Teaching n	nethods								
	1. Speech	1								
	2. Project	Base Learning								
	3. Case Ba	ase Learning								
	4. Group	Discussion								
6.	Assessmen	it methods								
	1. Individ	lual work								
	2. Group	work								
7.	This modu	le/course is use	ed in	the follow	ving study	y prog	ramme/s as v	wel	l	
	N/A									
8.	Responsibi	ility for module	/cou	rse						
	Prof. Dr.M.	Halim Natsir,S.	Pt,MP	P. IPM. ASI	EAN Eng					
9.	Other infor	rmation (Refere	ences)						
	1. Costa, l	EZX. 2009. Arti	ficial	intelligen	ce in Anii	mal Sci	ence. R. Bras	5. Zo	ootec., v.38,	
	p.390-3	396								
	2. Murray	y Shanahan,Mat	thew	Crosby, E	Benjamin	Beyre	t, and Lucy C	hek	ke. 2020.	
	Artificial Intelligence and the Common Sense of Animals. Trends in Cognitive									
	Science	es, November 2	020, 1	Vol. 24, No	o. 11					
	3. Gota M	lorota, Ricardo	V. Ve	ntura Fab	yano F. S	ilva,Ma	asanori Koya	ma,	, and	
	Samod	ha								
	4. C. Fern	and. 2018. BIG	DATA	A ANALYT	ICS AND	PREC	SION ANIMA	AL A	GRICULTURE	
	SYMPO	SIUM: Machine	e leari	ning and c	lata mini	ng adv	ance predict	ive	big data	
	analysi	is in precision a	inima	l agricultı	ure1. J. Ar	nim. Sc	i. 2018.96:15	540	-1550	
	5. Big Dat	ta Now. O'Reilly	v Med	ia, Inc. 20	15					
	6. Introdu	uction to Data N	Ainin	g and Ana	lytics Big	Г 5				

RESEARCH METHODOLOGY AND SCIENTIFIC WRITING											
modu	ıle/	Student	Cr	edits	Semester		Frequency		Duration		
cours	se	work- load	3 5	SCU	1 st Sem.		Each Semester		1 semester		
code		228 hours									
PEF8	0001					•					
1.	Types of	courses		Contact hours			dependent study	Cla	ss size		
	Compulso	ry Course		48 hours	5	180	hours	20-	25 students		
2.	Prerequ	isites for partici	pati	ion (if ap	plicable)						
	-	-	-		-						
2	T !	• • • • • • • • • • • • • • • • • • • •									
3.	1 Apply	g outcomes ving logical critic	als	systemati	ic and creat	ive	thinking in the fie	ld of	f animal		
	husba	andry through sc	ient	ific resea	arch and the	res	sults of studies bas	sed o	on rules,		
	procedures, and scientific ethics in the form of a thesis (ILO1)										
	2. Arran	ige and communi	cate	ideas, so	cientific idea	s an	d opinions respons	sibly	and are		
	research in a forum (ILO2)										
	3. Ident	ify the scientific fi	ields	s that are	the object o	fres	search and position	ı the	m into a		
	resea	arch map developed through an inter and multi-disciplinary approach (ILO6)									
4.	Subject a	aims/Content									
	This cour	rse includes unde	rsta	nding in	preparing a	rese	earch proposal, res	earc	h report and		
	backgrou	ind, identification	a or	d formula	ation of prob	olem	is, research objecti	ves a	and benefits.		
	hypothes	ses, literature rev	iew,	a frame	work of thou	ught <u></u>	, research methods	s and	l operational		
	research	frameworks, lit	erat	ure stud	ly research,	sta	tistical design sel	ectio	on and data		
	analysis, attachme	results and d	itin	ission, c g scientif	ic papers	and	a suggestions, b	IDIIO	grapny and		
5.	Teaching	g methods		8							
	1. Speed	:h									
	2. Proje	ct Based Learning	3								
	3. Case	Dased learning									
6.	Assessm	ent methods									
0.	1. Indivi	idual work									
	2. Group	o work									
7.	This mo	dule/course is u	sed	in the fo	ollowing stu	dy j	programme/s as v	well			
	N/A										
8.	Respons	ibility for modu	le/c	ourse							
01	Prof. Dr.	Ir. Trinil Susilawa	nti. N	AS. IPU. A	SEAN Eng						
			, -'								
9.	Other in	formation									
	1. Statis	tika dan rancanga	an p	ercobaar	n penerapan	dala	am bidang peterna	kan(Herni		
	sudar	wati dkk, UB Pres	ss)	o noncol-	oon don bo		mich) (Vogi augit-	- תון	rocol		
	∠. Meto	ie renentian (Me	erod	e percob	aan dan Kary	ya II	imanj (rogi sugito,	, nat	nessj		

3.	Metode penelitian (kupas tuntas mencapai tujuan)(Sri kumala ningsih , UBpress)
4.	Prinsip-prinsip menyusun kuisioner (Eko Nugroho, UB Press)

Department of Animal Production Compulsory Courses

ANIMA	L PRODUCT	FION PHYSIOL	OGY						
Modul Code	e/Course	Student workload	Cre 3 S(dits CU	Semest 1 st seme	er ester	Frequency Each	7	Duration 1 semester
1	Trmes of a	220 11001 5		Contact	hours	Indo	seniester	CI	
1.	Types of c	ourses		Contact nours Inde			pendent		ass size
	Compuisor	y course		48 110013	5	100 k	y	20	J-25 students
						1001	iours		
						(Stru Secio	nmont 80		
						hour	s self		
						learn	ing 100		
						hours	s)		
2.	Prereauisit	tes for participa	ation				-)		
	-	···· ··· F ·····F ·							
3.	Intended	Learning Outco	omes	:					
	1. Develo	op and commur	nicate	ideas, the	oughts an	d scie	ntific opinior	is r	esponsibly
	and ba	ased on academ	ic eth	ics and co	ommunic	ate res	search result	s in	a forum.
	2. Able to	master the the	ory o	f the lives	tock indı	ıstry (breeding, fee	edin	g,
	manag	ement, livestoc	k pro	duct techi	nology an	d lives	stock agribus	sine	ess) and have
	the abi	lity to develop	comp	etitive loc	al resour	ces.			
	3. Able to	apply innovati	ve te	chnology	based on	inter-	disciplinary a	and	multi-
	discipli	inary in the dev	relopi	nent of th	e livesto	ck indu	ıstry.		
	Course Lea	arning outcom	ies:						
	1. Studen	ts are able to d	escrit	be the phy	vsiologica	l mech	ianism of the	e pr	oduction
	proces	s including inte	rnal a	and extern	hal factor	s that	affect the gro	owt	h and
	develo	pment of livest	OCK			1 1			
	Z. Studen	its are able to d	escrit	be the phy	siologica	I mecr	anism of the	e pro	oduction
	2 Studen	s including inte	rnal a	inu exteri		s that i	anect the par	riur	aduction
	5. Studen	s including into	rnal (nd ovtor	al factor	s that	affect lactation	pr	ounction
	A Studen	ts are able to d	oscrit	nu exteri		l mach	anect lactation	nr.	oduction
	nroces	s including inte	rnal	and extern	al factor	s that	affect the egg	י רח ס fo	rmation
	proces	s.	i nui t		iui iuctoi	5 that		5 10	mation
	5. Studen	ts are able to d	escrił	be the phy	vsiologica	l mech	anism of the	e pr	oduction
	proces	s including inte	rnal a	and extern	al factor	s that	affect enviro	nm	ental
	adapta	tion.							
4.	Subject ain	ns/content							
	This course	e explains the p	hysic	ological m	echanism	n of the	e production	pro	ocess
	including in	nternal and ext	ernal	factors th	at suppo	rt live	stock produc	tivi	ty, including;
	growth and	d development,	phys	iology of ۱	parturitio	on, lact	ation, egg fo	rma	ation, and
	environme	ental adaptation	1.						
5.	Teaching n	nethods							
	1. Speech								
	2. Project	Base Learning							
	3. Case Ba	ase Learning							
(4. Group	Discussion							
6.	Assessmen	it methods							
	1. 1101010	work							
7	2. Group	work le/course is use	ad in 1	the follow	ing stude	/ nrom	camme /s ac	امري	1
/.	N/A		Jum		ing study	, hroßi	amme/ 5 as v	vv el	1
8	Responsibi	ility for module		rse					
0.	Dr. Ir. Ita V	Vahvu Nursita	M.Sc						

9.	Other information (References)
	1. Bath, L.D., Dickinson, F.N., Tucker, A.H and Appleman, R.D. 1985. Dairy Cattle.,
	Principle, Practice, Problems, Profits. Third Edition. LEA and FEBRIGER
	PHILADEPLHIA.
	2. Lim-Sylianco, C.Y. 1984. Modern Biochemistry. Second Edition. First Printing.
	Aurum Technical Books. Balintawak-Quezon City, Phillipines.
	3. Schmidt, G,H and Van Vleck., L.D. 1970. Principles of Dairy Science. W.H. Freeman
	and Company. San Francisco.
	4. Bykov, K.M., Vladimirov, G.A., Delov, V.Y., Konradi, G.P and Slonim, A.D. 1960.
	Textbook of Physiology. Foreign Languages Pubishing House Moscow.
	5. Wilson, J,A.1979. Principles Of Animal Physiology. Second Edition. Collier
	Macmillan International Editions. OHO University New York. London
	6. Campbell, Reece, and Mitchell, Biologi, Edisi 5, 2000.
	7. Chapman and Hall, N.Y., A Textbook of Histology 12th edition, 1994.
	8. Alberts et al. Molecular Biology of the Cell, Garland Publishing, N.Y. Third edition,
	1994.
	9. Altan O, Pabuccuoglu A, Alton A, Konyalioglu S, Bayraktar H.,2003. Effect of Heat
	10. Stress on Oxidative Stress, Lipid Peroxidation And Some Stress Parameters In
	Broilers. Br Poult Sci 2003; 4: 545-50.
	11. FAO. 2006a. Livestock's Long Shadow – Environmental Issues And Options, H.
	Steinfeld, P. Gerber, T. Wassenaar, V. Castel, M. Rosales, and C. de Haan (eds),
	Rome, Italy: Food and Agriculture Organization of the United Nations.
	12. Dr Muhammad Ashiq Toor DVM , B s c (Zoology) Islamia University of Bahawal
	Pur (IUB) (2010 – 2015) +92-344-499-7375 +92-300-364-2402 Mammary
	system, Milk Synthesis, Milk Let-down & Milking

ANIMAL PRODUCTION TECHNOLOGY								
le/Course	Student	Credits		Semester		Frequency	7	Duration
-	workload	3 SC	CU	1 st seme	ester	Each		1 Semester
002	228 hours					Semesters		
Types of c	ourses		Contact	hours	Inde	pendent	Cl	ass size
Compulsor	y Course		48 hour	S	stud	V	20	-25 students
1	5				180 ł	iours		
					(stru	ctural		
					assig	nment 80		
					hour	s and self		
					learn	ing 100		
		hours)						
Prerequisit	tes for participa	ation						
-								
Intended I	Learning Outco	omes	:					
1. Able to	apply innovati	ve teo	chnology	based on	inter-	disciplinary a	and	multi-
discipli	inary in the dev	relopr	nent of th	e livesto	ck indı	ıstry (CP4)		
2. positio	ning into a rese	earch	map deve	eloped th	rough	an inter and	mu	lti-
discipli	inary approach	(CP6)					
3. Increas	se independent	learn	ing capac	ty (CP7)				
Course lea	irning outcom	es:						
1. Studen	ts are able to cl	noose	technic f	or the de	velopn	nent of livest	ock	production.
2. Studen	ts are able to ev	valuat	te the pro	duction of	of tech	nological res	ults	
3. Studen	ts are able to a	pply a	ind apply	technolo	gy to i	ncrease proc	luct	ion.
Subject ain	ns/content	J J		C 12		1		11 1
Inis cours	e explains the	devel	opment c	of livesto	ck pro	auction pote	ntia	al by applying
technic and	l IIIIIOVationi to	uairy	cattle, Dr	ollers, po	uitry a	nu miscellan	eot	is livestock on
managama	al level, includi	ng Dr	eeding ar	la increas	sing pr	oductivity (i)ree	d on livestack
welfare	intj, indieculai	tecim	ology all	levaluati			ase	u oli livestock
Teaching n	nethods							
1. Speech	lethous							
2. Project	Base Learning							
3. Case Ba	ase Learning							
4. Group	Discussion							
Assessmen	t methods							
1. Individ	ual work							
2. Group	work							
This modu	le/course is use	ed in t	the follow	ving study	/ progi	amme/s as v	well	l
N/A								
N/A Responsibi	ility for module	/coui	se					
N/A Responsibi Dr. Ir. Tri E	ility for module Iko Susilorini, M	/coui IP. AS	rse SEAN Eng					
N/A Responsibi Dr. Ir. Tri E Other infor	ility for module ko Susilorini, M mation (Refere	/cour IP. AS ences	rse SEAN Eng)		1	M		
N/A Responsible Dr. Ir. Tri E Other infor 1. Taylor.	ility for module ko Susilorini, M mation (Refere R.E. (1992) Sie	/cour 1P. AS ences] entific	rse SEAN Eng) : Farm An	imal Proc	ducton	. Mac. Millan	Pu	blishing Com
N/A Responsibi Dr. Ir. Tri E Other infor 1. Taylor. New Yo	ility for module ko Susilorini, M mation (Refere R.E. (1992) Sie ork	/cour 1P. AS ences] entific	rse SEAN Eng) Farm An	imal Prod	ducton	. Mac. Millan	Pu	blishing Com
	AL PRODUCT e/Course 002 Types of c Compulsor Prerequisit - Intended I 1. Able to discipli 2. positio discipli 3. Increas Course lea 1. Studen 2. Studen 3. Studen 3. Studen 3. Studen 3. Studen 4. Group Assessmen 1. Individ 2. Project 3. Case Ba 4. Group Assessmen 1. Individ 2. Group This modu	AL PRODUCTION TECHNOI le/Course Student workload 002 228 hours Types of courses Compulsory Course Prerequisites for participation - Intended Learning Outcome 1. Able to apply innovation disciplinary in the devication 2. positioning into a reserve disciplinary approach 3. Increase independent Course learning outcom 1. Students are able to cl 2. Students are able to cl 2. Students are able to cl 3. Students are able to apply innovation to an industrial level, including an industrial level, including Management), molecular welfare. Teaching methods 1. Speech 2. Project Base Learning 3. Case Base Learning 4. Group Discussion Assessment methods 1. Individual work 2. Group work This module/course is use	AL PRODUCTION TECHNOLOGY le/Course Student workload Cree 3 SC 002 228 hours 3 SC Types of courses Compulsory Course Prerequisites for participation - - Intended Learning Outcomes Intended Learning Outcomes 1. Able to apply innovative technic and innovation to disciplinary in the develop 2. 2. positioning into a research disciplinary approach (CP6) 3. Increase independent learn Course learning outcomes: 1. Students are able to choose 2. Students are able to apply a Subject aims/content This course explains the devel technic and innovation to dairy an industrial level, including br management), molecular techn welfare. Teaching methods 1. Speech 2. Project Base Learning 3. Case Base Learning 3. Case Base Learning <	AL PRODUCTION TECHNOLOGY e/Course Student workload Credits 3 SCU 002 228 hours 3 SCU Types of courses Contact 48 hour Compulsory Course 48 hour Prerequisites for participation - Intended Learning Outcomes: 1 Able to apply innovative technology disciplinary in the development of th 2. positioning into a research map devel disciplinary approach (CP6) 3. Increase independent learning capace Course learning outcomes: 1. Students are able to choose technic f 2. Students are able to apply and apply Subject aims/content This course explains the development of technic and innovation to dairy cattle, bro an industrial level, including breeding ar management), molecular technology and welfare. Teaching methods 1. Speech 2. Project Base Learning 3. Case Base Learning 4. Group Discussion Assessment methods 1. Individual work 2. Group work	AL PRODUCTION TECHNOLOGY le/Course Student workload Credits 3 SCU Semest 1 st seme 002 228 hours 3 SCU 1 st seme Types of courses Compulsory Course Contact hours Prerequisites for participation 48 hours - Intended Learning Outcomes: 1 1. Able to apply innovative technology based on disciplinary in the development of the livestor 2. positioning into a research map developed the disciplinary approach (CP6) 3. Increase independent learning capacity (CP7) Course learning outcomes: 1. Students are able to choose technic for the de? Students are able to apply and apply technolo Subject aims/content This course explains the development of livestor technic and innovation to dairy cattle, broilers, po an industrial level, including breeding and increase management), molecular technology and evaluati welfare. Teaching methods 1. Speech 2. Project Base Learning 3. Case Base Learning 3. Case Base Learning 4. Group Discussion Assessment methods 1. Individual work 2. Group work This module/course is used in the following study	AL PRODUCTION TECHNOLOGY le/Course Student workload Credits 3 SCU Semester 002 228 hours 1st semester Types of courses Contact hours Indep Compulsory Course 48 hours 180 f (strue assign hours 180 f (strue assign hours Prerequisites for participation - - Intended Learning Outcomes: 1 1. Able to apply innovative technology based on inter- disciplinary in the development of the livestock indu 2. positioning into a research map developed through a disciplinary approach (CP6) 1 3. Increase independent learning capacity (CP7) Course learning outcomes: 1 1. Students are able to choose technic for the developm 2. Students are able to apply and apply technology to in Subject aims/content 1 This course explains the development of livestock production of technic an industrial level, including breeding and increasing pr management), molecular technology and evaluation of p welfare. 1 Teaching methods 1 Speech 2 2. Group Work 1 1 This module/course is used in the following study program 1	AL PRODUCTION TECHNOLOGY le/Course Student workload Credits 3 SCU Semester Frequency Each Semesters 002 228 hours 3 SCU 1st semester Frequency Each 002 228 hours Contact hours Independent Compulsory Course 48 hours Independent 48 hours 180 hours (structural assignment 80 hours and self learning 100 hours) Prerequisites for participation - Intended Learning Outcomes: 1. Able to apply innovative technology based on inter-disciplinary disciplinary in the development of the livestock industry (CP4) 2. positioning into a research map developed through an inter and disciplinary approach (CP6) 3. Increase independent learning capacity (CP7) Course learning outcomes: 1. Students are able to choose technic for the development of livest 2. Students are able to apply and apply technology to increase prod Subject aims/content This course explains the development of livestock production pote technic and innovation to dairy cattle, broilers, poultry and miscellan an industrial level, including breeding and increasing productivity (I management), molecular technology and evaluation of production b welfare. Teaching methods 1. Speech 2. Project Base Learning 3. Case Base Learning 3. Case Bas	AL PRODUCTION TECHNOLOGY ie/Course Student workload 228 hours Credits 3 SCU Semester 1st semester Frequency Each Semesters Types of courses Compulsory Course Contact hours 48 hours Independent study 180 hours (structural assignment 80 hours and self learning 100 hours) CI 180 hours Prerequisites for participation - Intended Learning Outcomes: Interded Learning Outcomes: 1. Able to apply innovative technology based on inter-disciplinary and disciplinary in the development of the livestock industry (CP4) 2. positioning into a research map developed through an inter and mu disciplinary approach (CP6) 3. Increase independent learning capacity (CP7) Course learning outcomes: 1. Students are able to choose technic for the development of livestock 2. Students are able to apply and apply technology to increase product Subject aims/content This course explains the development of livestock production potentia technic and innovation to dairy cattle, broilers, poultry and miscellaneou an industrial level, including breeding and increasing productivity (bree management), molecular technology and evaluation of production base welfare. Teaching methods 1. Individual work 2. Group work 2. Group work

ANIMA	L PRODUCT	<u>FION DEVELOF</u>	<u>MEN</u>	Τ					
Modul	e/Course	Student	Cre	dits	Semester		Frequency	7	Duration
Code		workload	3 SC	CU	1 st seme	ester	Each		1 Semester
PEP800	003	228 hours					Semester		
1.	Types of c	ourses		Contact	hours	Inde	pendent	Cl	ass size
	Compulsor	y Course		48 hours	S	study	y	20	0-25 students
						180 ł	nours		
						(stru	ctural		
						assig	nment 80		
						hours	s, self		
						learn	ing 100		
						hours	5)		
2.	Prerequisi	tes for participa	ation						
	-								
3.	Intended	Learning Outco	omes	:					
	1. Implen	nent a strategy	to inc	rease live	stock pro	oductio	on on dairy, i	nea	at, poultry,
	and va	rious livestock	on th	e scale of	smallholo	der and	d industrial f	arm	ns.
	2. Describ	be the science o	f anir	nal husba	ndry mai	nagem	ent for the d	eve	lopment of
	dairy, 1	neat, poultry, a	nd va	rious live	stock pro	oductio	on.		
	3. Able to	plan livestock	prod	uction dev	velopmer	nt.			
	Course Le	arning outcom	ies:	_					
	1. Master	ing the theory	of live	estock ma	nagemen	it (bree	eding, feedin	g, a	nd
	manag	ement) accordi	ng to	Good Far	ming Pra	ctices	(GFP) guidel	ines	S
	2. Descril	be the science o	of live	stock mar	nagement	t for th	e developme	ent o	of dairy, meat,
	poultry	7, and miscellan	ieous	livestock	producti	on			
	3. Implen	nent a strategy	to inc	rease live	stock pro	oducti	on on dairy, i	mea	at, poultry,
-	and mi	scellaneous live	estoc	c on the se	cale of sn	nallhol	der and indu	stri	ial farms.
4.	Subject ain	ns/content							
	This cours	e explores live	stock	manager	nent and	desig	ns the devel	opr	ment of dairy,
	meat, pour	try, and misce	llane	ous livest	ock proc	luction	according	to (Jood Farming
-	Practices (GFPJ, animal w	elfare	e, and regi	ilations.				
5.	1 eaching n	netnoas							
	1. Speech								
	2. Project	. Base Learning							
	5. Case ba	Discussion							
6	4. Group	t mothodo							
0.	1 Individ	lual work							
	2 Group	work							
7	This modu	le/course is use	d in	the follow	ing study	z nrogi		well	1
/·	N/A	10/ 004130 15 430	-u III		ing study	, Progr	amme _j 5 as		•
8	Responsibi	ility for module	/com	rse					
0.	Dr Ir Edv	Sudiarwo MS	7000	30					
9	Other info	mation (Refere	nces)					
	1. S.I. Oos	ting, H.M.I. Udo	D. T.C.	, Viets. Dev	velopmer	nt of liv	vestock prod	ucti	ion in the
	tropics	: farm and farm	iers' i	perspectiv	ves, Anim	al, Vol	ume 8. Issue	8.2	2014, Page
	1238-1248 ISSN 1751-7311. https://doi.org/10.1017/S1751731114000548								4000548.
	2. Abraha	imsson, P., and	Taus	on, R., 199	95. Aviar	y syste	ms and conv	vent	tional cages
	for lavi	ing hens. Effect	s on n	roductior	1, egg aua	ality. h	ealth and bir	d lo	ocation in
	three h	ybrids. Acta Ag	ric. S	cand. A Ar	1im. Sci. 4	45:191	-203.	-	
	3. Chamb	ers J.R., 1990. 0	Genet	ics of grov	vth and n	neat pi	roduction in	chio	ckens. In:
	Crawfo	ord RD, editor. H	oultr	y Breedin	ig and Ge	netics.	Publication	by A	Amsterdam.
	New Yo	ork: Elsevier; p	p. <u>5</u> 99	9-644					

Department of Animal Production Elective Courses

INDUS	INDUSTRY OF RUMINANT PRODUCTION									
Modul	e/Course	Student	Cre	dits	Semest	er	Frequency	7	Duration	
Code		workload	3 S(CU	1 st seme	ester	Each		1 Semester	
PEP800	004	228 hours					Semesters			
1.	Types of c	ourses		Contact	hours	Inde	pendent	endent Class size		
	Elective Co	ourses		48 hours	5	stud	v	20)-25 students	
						180 ł	iours			
						(stru	ctural			
						assig	nment 80			
						hour	s and self			
						learn	ing 100			
						hours	s)			
2.	Prerequisit	tes for participa	ation							
	-									
3.	Intended	Learning Outco	omes	:						
	1. Able to	o master the the	eory	of the live	stock ind	ustry	(breeding, fe	edii	ng,	
	manag	gement, livestoo	ck pro	oduct tech	nology a	nd live	stock agribu	sin	ess) and have	
	the ab	ility to develop	com	oetitive lo	cal resou	rces ((CP3)			
	2. Able to	o apply innovat	ive te	chnology	based or	inter	disciplinary a	and	multi-	
	discip	linary in the de [.]	velop	ment of tl	ne livesto	ck ind	ustry (CP4)			
	3. Identi	fy the scientific	field	that is the	e object o	f resea	irch and posi	itio	n it into a	
	resear	ch map develo	ped tl	าrough an	inter and	d mult	i-disciplinary	у ар	proach (CP	
	6)									
	4. Increase independent learning capacity (CP7)									
	Course Learning outcomes:									
	1. Studen	ts are able to m	naster	the conce	ept and a	nalyze	the dynamic	CS O	f the	
	rumina	ant livestock inc	dustry	y based or	n the dev	elopm	ent and proje	ecti	on of the	
	livesto	ck population a	nd its	s developr	nent stra	tegy ir	n accordance	wi	th regulations	
	2. Studen	ts are able to a	pply t	he concep	ot of rum	inant l	ivestock grov	wth	and	
	develo	pment in accord	dance	e with the	ruminan	t lives	tock product	ion	process	
	3. Studen	ts are able to d	esign	the struct	ture, func	tion a	nd layout of t	the	cage along	
	with th	ie instruments ((lives	tock engii	neering)			_		
	4. Studen	its are able to ev	valua	te the qua	lity assu	ance o	of ruminant l	ives	stock	
	produc	cts (breed and b	oreed	ing produ	ction of li	ivesto	ck that are he	ealt	hy and whose	
	welfare	e is guaranteed	as we	ell as trace	eability o	t halal	products in	acco	ordance with	
	good fa	arming practice	s/goo	od dairy fa	arming pi	actice	s and regula	tion	IS.	
4.	Subject ain	ns/content	J)				. C			
	I his course	e describes the	aeve.	lopment a	nd applic	cation	of optimal m	ana	igement of	
	une rumina	int investock int	lustry	/ Daseu or	ligood iai	ming	practices/go	00 (uairy	
	practices a	nu regulations	to pro	ouuce qua	inty prod	ucts w	ith traceabil	ity a	and	
	Taceabing	y of supply char	ns su	stamable.						
5.	1 Speech	lietiious								
	1. Speech	Base Learning								
	2. Troject	L Dase Learning								
	J. Case Da	Discussion								
6	Accessmon	nt mothods								
0.	1 Individ	lual work								
	2 Group	work								
7	This modu	le/course is use	d in	the follow	ing stude	/ nrom	camme /s as s	آمري	1	
/.	N/A		Jum		ing study	, progr	annie/s as	vv CI.	1	
8	Responsibi	ility for module	/com	rse						
0.	Dr Ir Kues	wati MS IPM Δ	SFAN	I Eno						
	1. II. Kusv	wacı, 1910.,11 191. A	JULAN	<u> </u>						

9. Other information (References)

INDUS'	NDUSTRY OF NON-RUMINANT PRODUCTION									
Modul	e/Course	Student	Cre	dits	Semester		Frequency		Duration	
Code	,	workload	3 SC	CU	1 st semester		Each		1 Semester	
PEP 80	005	228 hours				Semesters				
1.	Types of c	ourses		Contact	hours	Inde	pendent	Cl	ass size	
1	Elective Co	urse		48 hour	s	stud	v	20)-25 students	
	Licetive de	, ai be		10 Hour		180	ours		20 50000000	
						(stru	ictural			
						assio	nment 80			
						hour	s and self			
						learn	ing 100			
						hour	s)			
2	Prerequisit	tes for narticina	ation			nour	5)			
2.	-		1011							
3	Intended I	Learning Outc	omes	•						
5.	1 Able to	annly innovati	vo to	hnology	hasad on	intor-	disciplinary	and	multi-	
	1. Abic to	inary in the dev	ve ici	nont of th	o liveste	ck indu	uiscipiiliai y a	anu	munti-	
	2 Identify	w the scientific	fiold t	hat is the	object of	rocon	rch and nosit	ion	it into a	
	z. ruentii	ch man develon	ad th	rough an	inter and	l multi	-disciplinary	2011	aroach (CP6)	
	3 Increase	se indenendent	learn	ing canac	ity (CP7)	munti	uiscipiinary	apı		
	Course Les	arning Outcon	10011	ing capac						
	1 Studen	ts are able to m	naster	the conc	ent and a	nalvze	the dynamic	ה אי	f the non-	
	rumina	ant livestock in	lustry	v hased or	the dev	elonm	ent and proje	rti	on of the	
	livesto	ck nonulation a	nd its	, buseu oi s develoni	nent stra	teov ir	accordance	wit	th regulations	
	2 Studen	ts are able to a	nnlv t	he concer	nt of non-	rumin	ant livestock	σr	owth in	
	2. Studien	ance with the n	on-ri	iminant li	vestock r	roduc	tion process	. 61 (
	3 Studen	ts are able to d	esion	the struct	ture fund	rtion a	nd layout of t	the	house along	
	with th	e instruments/	'eauir	oment (liv	vestock ei	nginee	ring)		nouse arong	
	4 Studen	ts are able to e	valua	te the qua	lity assu	rance o	of non-rumin	ant	livestock	
	produc	rts (breed and r	rodu	ction) fro	m health	v and g	non runnin maranteed w	velf	are and	
	traceat	pility of halal pr	oduc	ts in acco	rdance w	ith god	od farming pi	ract	ices and	
	regulat	tions.	ouuc		uunee w	itii got		ucc	lices and	
4.	Subject ain	ns/content								
	This course	e describes the	deve	lopment a	nd appli	cation	of optimal m	ana	gement of	
	the non-ru	minant livestoo	k ind	ustrv bas	ed on goo	od farn	ning practice	s ar	nd regulations	
	to produce	quality produc	ts wi	th traceat	oility and	sustai	nable supply	cha	ains.	
5.	Teaching n	nethods			¥					
	1. Speech	l								
	2. Project	Base Learning								
	3. Case Ba	ase Learning								
	4. Group	Discussion								
6.	Assessmen	it methods								
	1. Individ	lual work								
	2. Group	work								
7.	This modu	le/course is use	ed in t	the follow	ving study	y prog	ramme/s as v	well	l	
	N/A	-				. 0				
8.	Responsibi	ility for module	/coui	rse						
	Prof.Dr.Ir.	Veronica Marga	ireta .	Ani Nurgi	artinings	ih , M.	Sc.			
9.	Other infor	rmation (Refere	ences)						
	1. Anonin	nous. 2020. Bul	ku Sta	itistik dan	Kesehat	an Hev	wan. Direkto	rat	Jenderal	
	Peterna	akan. Jakarta.								

	2.	Bell, D.D., W.D. Weaver. 2002. Commercial Chicken Meat and Egg Production.
		Academic Publisher. United States of America.
	3.	Journal Poultry Science
	4.	Journal Animal Production

ANIMA	NIMAL WASTE MANAGEMENT INDUSTRY										
Module	e/Course	Student	Cre	dits	Semester		Frequency	7	Duration		
Code	,	workload	3 S(CU	1 st semester		Each	1 Semester			
PEP 80	006	228 hours					Semester				
1	Types of c			Contact	hours	Inde	nendent	CI	ass size		
1.	Floctive Co			10 hour	nouis	ctud		20	25 students		
	Elective Co	ul se		40 11001	5	100 k	y Nourc	20	-25 students		
						1001					
						(stru	ctural				
						assig	nment 80				
						hour	s and self				
						learn	ing 100				
						minu	tesj				
2.	Prerequisit	tes for participa	ation								
	-										
3.	Intended I	Learning Outco	omes	:							
	1. Able to	o master the the	eory	of the live	stock ind	ustry	(breeding, fe	edir	ng,		
	manag	gement, livestoo	ck pro	oduct tech	nology a	nd live	stock agribu	sine	ess) and have		
	the ab	ility to develop	com	oetitive lo	cal resou	rces (0	CP3)				
	2. Able to	o apply innovat	ive te	chnology	based or	n inter-	-disciplinary	and	d multi-		
	discipl	linary in develo	ping	the livest	ock indus	stry (C	P4)				
	Course Lea	arning outcom	ies:				-				
	1. Studen	ts are able to co	ondu	ct anaeroł	oic and ae	erobic	waste manag	gem	ent		
	techno	logy and evalua	ate pr	oduct aua	litv in ac	cordar	ice with app	, lical	ble		
	regulat	regulations									
	2. Studen	ts are able to de	esign	open (aei	obic) and	d close	d (anaerobio	r) ai	nimal waste		
	technol	logy and evalua	te nr	oduct auz	lity	a crobe	a (anaciobit	.) ui			
	3 Studen	ts are able to in	nnlen	nented an	imal was	te tecł	nology aero	hic	and		
	anaero	hic and evaluat	te nro	duct qua	litv		inology acro	bie	una		
	4 Studen	ts are able to ev	valua	te nroduc	t quality	assura	nce in accord	lan	ce with		
	annlica	ble regulations	or St	andar Na	sional In	donesi	a (SNI)	aum			
4	Subject ain	ns/content	01 01				a (0111).				
1.	This course	e discusses live	stock	industry	waste ma	anager	nent technol	ngv	with learning		
	sub-achiev	ements: onen	mana	industry igement t	echnolog	w (aer	obic/air/blo	wir	vien learning		
	and closed	management f	tochn	ology (an	aprohic/	withou	it ovygen) a	2 XA7	all as product		
	and closed	lustion technol		o he marl	act oble	nmore	it oxygenj a.	5 000	en as produce		
5	Toaching r	nuation teenno	logy t		acteu/ coi	micic	lalizeu.				
5.	1 Chooch	letilous									
	2 Project	Base Learning									
	2. Troject	Dase Learning									
	J. Case Da	Discussion									
6	4. Group	t mothoda									
0.	Assessmen										
	$\begin{array}{c} 1. \\ 2 \\ 2 \\ \end{array}$	lual WOLK									
7	Z. Group	WOI K	:	L	····						
7.	This modu	le/course is use	ea in	the follow	ing study	/ prog	ramme/s as v	weil	l		
-	N/A										
8.	Responsibi	lity for module	/cou	rse							
	Prof. Dr. Ir	. Moch. Yunus,	MS.								
9.	Other infor	mation (Refere	ences)							
	1. Teodor	rita Al Seadi,	Dom	iinik Rut	z, Heinz	Pras	sl, Michael	Kö	ttner, Tobias		
	Finster	walder, Silke V	'olk, F	Rainer Jan	ssen (20	08) Bi	ogas Handbo	ook.	Published by		
	Univers	sity of Southern	n Den	ımark Est	jerg, Nie	ls Boh	rs Vej 9-10, 🛛	DK-	6700 Esbjerg,		
	Denma	rk									

2	 Design and development and testing of an improved tilting hydraulic flume for runoff and soil loss simulation studies Scientific Figure on ResearchGate. Available https://www.researchgate.net/figure/IANTA-Model-Biogas-
	Plant_fig4_282182725 [accessed 11 Apr, 2020]

Department of Nutrition and Animal Compulsory Courses

FEED PROCESSING SCIENCE AND TECHNOLOGY										
Module/Cours		Student	Cre	dits	Semester		Frequency		Duration	
e Cod	e	workload	3 SCU		1 st		Each		1 Semester	
PEN8	0001	228 hours			semest	er Semester				
				semee						
1.	Types of	courses	1	Contact		Inde	pendent	Cl	ass size	
	Compulso	rv course		hours	-	stud	v	20)-25	
	compuiso	ry course		48 hours 18			hours	st	udents	
				10 noui	5	Strue	Structural		Students	
						assio	accignment			
						100	hours			
						indo	indonondonco			
						atud				
2	Dronoguia	itaa fan nantiai	notio			stuu	y 80 11001 S			
Ζ.	Prerequis	ites for partici	patio	011						
2	-									
3.	Learning	outcomes				,				
	1. Arrang	e and communi	cate i	deas, scie	ntific ide	as and	opinions res	por	isibly and are	
	Dased o	on academic eth	(02)		inicate th	ie resu	its of investor	жп	ndustry	
	2 Abla to	maatar tha live	ut o alu	inductor	theory (c	maaifi	ally broadin	a fe	ading and	
	2. Able to	omont animal r	rodu	ct tochnol	logy and s	agribu	cinoce) and h	g, 16	seuling, anu	
	management, animal product technology and agribusiness) and have ability to develop competitive local resources (ILO3)									
	Able to apply innovative, multidisciplinary technology in the development of the									
	livestock industry (ILO4)									
4.	Subject aims/content									
	This course discusses feed ingredient processing technology (prot					(protection,				
	fermentation, preservation) and feed additive production techn				chnology for					
	ruminant, non-ruminant and forage livestock. Furthermore, this course									
	examines the formulation of non-ruminant and ruminant animal feed.									
5.	Teaching methods									
	1. Speech									
	2. Project Based Learning									
	3. Case Based Learning									
	4. Group	Discussion								
6	Assessme	nt methods								
0.	1 Individual work									
	2 Group work									
	= aroup									
7.	This modu	ule/course is u	sed i	n the foll	owing st	tudy p	rogramme/	's a	s well	
	N/A									
8.	Responsit	oility for modu	le/co	ourse						
	1. Pro	of. Dr.Ir. Hartuti	k, MP	. IPU. ASE	AN Eng (Coordi	inator)			
	2. Pro	of. Dr.Ir. Siti Chu	zaem	i, MS. IPU	ASEAN E	Eng				
	3. Dr.	Ir. Eko Widodo,	M.Ag	r.Sc. M.Sc						
	4. Dr.	Ir. M. Halim Nat	tsir, MP. IPM. ASEAN Eng							
	5. Dr.Ir. Siti Nurul Kamaliyah, MP									

	6. Dr. Ir. Hermanto, MP
9.	Other information (References)
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	digestion and metabolism. CAB International. Cambridge, USA.
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Modu ⊢/CourseStudentCreditsSemesterFrequencyDuratione Codeworkload $3 S ∪ $ $1^{st} ∪ $ Each1 SemesterPEN8002228 hours 28 hourssemesterSemesterSemester1 Semester1.Types of cursesContactIndependent $20 - 25$ Compulsory coursesI 48 hours $180 ∪ urs$ $20 - 25$ III $Structural$ $Structural$ $Structural$ IIII $Structural$ $Structural$ $Structural$ IIIII $Structural$ $Structural$ $Structural$ III					
e Codeworkload3 SCU1stEach1 SemesterPEN8002228 hours228 hoursSemesterSemesterSemesterContactIndependentClass size1.Types of coursesContacthoursstudy $20-25$ $20-25$ $20-25$ 48 hours 180 hours $students$ 48 hours180 hours $5tructural$ $students$ $students$ $5tructural$ $students$ 48 hours180 hours $students$ $students$ $students$ $students$ 48 hours 180 hours 100 hours $students$ $students$ 48 hours $180 + 100$ hours 100 hours 100 hours 100 hours48 hours 100 hours 100 hours 100 hours 100 hours48 hours 100 hours 100 hours 100 hours 100 hours					
PEN8002228 hourssemesterSemesterCalass size1.Types of coursesContactIndependentClass sizeCompulsory courseshoursstudy $20-25$ 48 hours180 hours $5tructural$ $students$ 6 48 hours $5tructural$ $5tructural$ 6 48 hours $5tructural$ $4ssigment 100$ 6 48 hours 48 hours $5tructural$ 7 48 hours $5tructural$ $4ssigment 100$ 7 48 hours 48 hours $4ssigment 100$ 7 48 hours 48 hours 48 hours8 48 hours 48 hours 48 hours9 48 hours 48 hours <td< th=""></td<>					
1.Types of courses Compulsory coursesContact hours 48 hoursIndependent study 180 hours Structural assigment 100 hours independence ctudy 90 hoursClass size 20-25 students					
Compulsory courseshoursstudy20-2548 hours180 hoursstudentsStructuralassigment 100hoursindependencestudy 20students					
48 hours Structural assigment 100 hours independence atudy 20 hours					
Structural assigment 100 hours independence atudu 80 hours					
assigment 100 hours independence					
hours independence					
independence					
study 00 hours					
2. Prerequisites for participation					
-					
3. Learning outcomes					
1. Arrange and communicate ideas, scientific ideas and opinions responsibly and a					
based on academic ethics and communicate the results of livestock industry					
research in a forum (ILO2)					
2. Able to master the livestock industry theory (specifically breeding, feeding, and					
management, animal product technology and agribusiness) and have ability to					
develop competitive local resources (ILO3)					
3. Able to apply innovative, multidisciplinary technology in the development of the					
livestock industry (ILO4)					
4. Subject aims/content					
This course explains the development and function of animal feed nutriti					
science and technology in a livestock business that can produce livesto					
products (high productivity and large scale livestock business), ASUH (sa					
healthy, intact and halal), friendly and safe for the environment, as well					
sustainable to meet/balance the number of requests/needs for livesto					
products which are continually increasing rapidly. The material discuss					
mainly focuses on the development of science that underlies the role an					
function of nutrition and animal feed science and technology in achieving t					
current and future demands of the livestock business and its products.					
5. Teaching methods					
1. Speech					
2. Project Base Learning					
3. Case Base Learning					
4. Group Discussion					
o. Assessment methods 1 Individual work					
1. Individual WOFK					
2. Group work					
7. This module/course is used in the following study programme/s as well					
N/A					
8. Responsibility for module/course					
1. Prof. Dr.Ir. Hendrawan Soetanto, M.Rur.Sc.					
2. Prof. Dr.Ir. Ifar Subagiyo, M.Agr. St.					
3. Dr.Ir. Marjuki, M.Sc.					

	4. Dr.Ir. Irfan H. Djunaedi. M.Sc.
	5. Dr. Rini Dwi S., S.Pt., MP
9.	Other information (References)
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	Ω Engineering $\Omega(2)$ $\Omega = 0.000$
	7. Eligineering, o(2), 04-00. 10 Culati S K Carg M R & Scott T W (2005) Rumon protected protein and fat
	produced from oilseeds and/or meals by formaldehyde treatment: their role in
	ruminant production and product quality: a review. Australian Journal of
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	rice straw and different treatments to improve its feed value for ruminants: a
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FEED	FEED EVALUATION SCIENCE AND TECHNIQUES									
Modu	lle/Cours	Student	Cre	dits	Semester		Frequency		y Duration	
e Cod	е	workload	3 SCU		1 st		Each		1 Semester	
PEN8	0003	228 hours			semest	er	Semester			
1	Types of courses		Contac	t	Independent		Class size			
	Compulsory course		hours		study		10	10-15		
				48 hour	°S	180 hours		students		
				io nouro		Stru	Structural		50000000	
						assigment 100				
						hours				
						independence				
						study 80 hours				
2.	Prerequis	ites for partici	patio	n			,			
	-									
3.	Learning	outcomes								
	1. Arrang	e and communi	cate i	deas, scie	ntific ide	as and	opinions res	por	nsibly and are	
	based o	on academic eth	nics an	nd commu	unicate th	e resu	lts of livestoo	ck ir	ndustry	
	researd	ch in a forum (II	L02)							
	2. Able to	master the live	stock	industry	theory (s	specific	cally breeding	g, fe	eding, and	
	manag	ement, animal p	orodu	ct technol	logy and a	agribu	siness) and h	ave	e ability to	
	develo	p competitive lo	ocal re	esources ((ILO3)					
4.	Subject ai	ms/content								
	This cours	se discusses:		.1 1	, ,	,	, ,	1.	C 1 . . .	
	1. Vai	rious feed evalu	ation	methods	have be	en dev	eloped or m	odif	fied to predict	
	fee	d quality.	-							
	2. Various techniques for evaluating feed and forage ingredients, antinutrients,									
	contaminants and feed biotechnology products physically, chemically and									
	biologically.									
	3. Quality standards of feed (ISO, KAN, HCCP and Sigma)									
	4. Evaluation of feed associated with various parameters in research. It is									
	obtaining quality feed that can support the potential for livestock productivity.									
	5. Interpretation of data from the evaluation of nutrition and its benefits for									
	livestock to support livestock business following the development of science.						nt of science.			
	6. No	more discussin	g the	evaluatio	n proced	ure teo	hnique			
5	Toaching	mathada								
5.	1 caulilig	methous								
	2 Project	- Raso Loarning								
	2. Project Base Learning									
	5. Case base Learning									
	4. Group	Discussion								
6.	Assessme	nt methods								
	1. Individual work									
2. Group work										
7.	This modu	ule/course is u	ised i	n the foll	lowing st	tudy p	rogramme/	's a	s well	
	N/A									

8.	Responsibility for module/course								
	1. Prof. Dr.Ir. Hartutik, MP. IPU. ASEAN Eng (Coordinator)								
	2. Osfar Sjofjan, Dr. Ir. M.Sc. IPU. ASEAN Eng.								
	3. Prof. Dr. Ir. Kusmartono								
	4. Mashudi, Dr. Ir. M.Agr.Sc. IPM. ASEAN Eng.								
	5. Irfan H. Djunaidi, Dr. Ir., M.Sc. IPM. ASEAN Eng.								
	6. Dr. Ir. Herni Sudarwati, MS								
0	7. Dr. Ir. Hermanto, MP								
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Department of Animal Nutrition Elective Courses

RUMI	RUMINANT FEED DEVELOPMENT STRATEGY									
Module/Cours		Student	Cre	dits	Semester		Frequency		Duration	
e Code		workload	3 SCU		1 st		Each		1 Semester	
PEN80004		228 hours			semester		Semester			
1.	Types of o	courses		Contac	t	Inde	pendent	Cl	ass size	
	Elective Co	ourse		hours		stud	study		20-25	
			48 hours		'S	180	hours	students		
						Struc	ctural			
						assig	hours			
						inde	s nondonco			
						study	v 80 hours			
2.	Prerequis	ites for partici	patio	n			,			
	-	I .	•							
3.	Learning o	outcomes								
	1. Arrang	e and communi	cate i	deas, scie	ntific ide	as and	opinions res	por	nsibly and are	
	based o	on academic eth	ics ar	nd commu	inicate th	ie resu	lts of livesto	ck ir	ndustry	
	researc	ch in a forum (II	-02) ataali	in durature	the entry (a	a a sifi	aller broadin	~ f.	ading and	
	Z. Able to	master the live	rodu	ct technol	logy and	agrihu	siness) and h	g, ie iave	eding, and	
	develo	p competitive lo	ocal re	esources (TLO3	451104	siness) and i	iu v c	control to	
	3. Able to	apply innovativ	ve, m	ultidiscipl	inary tec	hnolog	y in the deve	elop	oment of the	
	livesto	ck industry (ILC)4)	_	-	_	-	_		
4										
4.	This course is a follow-up to the three compulsory courses for Nutrition and						Jutrition and			
	Animal Fe	ed Denartmer	עם t th:	at have h	ee comp	n in s	emester 1	esn	ecially those	
	related to ruminants. This course subject is focused on comprehensive studies						nsive studies			
	in terms of technical aspects and the impact of the application of research									
	results or the results of the application of a strategy/technique to increase the									
	efficiency of feed utilization by livestock both to increase the production of high									
	ruminant livestock, ASUH, friendly and environmentally safe and sustainable, as									
	well as opportunities for their development. Some of these									
	strategies/techniques start from selecting the feed ingredients, processing,									
	formulating and giving them to livestock (precision feeding), including feed						cluding feed			
	additives	(rumen ferme	entati	ion mani	pulation	ı). Thi	s course m	ate	rial is in the	
	form of re	viewing resear	rch ai	rticles or	applying	g a stra	ategy/techn	iqu	ie to increase	
-	the efficie	ncy of feed by	lives	tock for t	the abov	e proc	luction purp	00S	es.	
5.	1 eaching 1	methods								
	1. Speech 2 Project	Raco Loarning								
	2. Project Base Learning									
	4 Group Discussion									
	aroup									
6.	Assessme	nt methods								
	1. Individ	ual work								
	2. Group	work								

7.	This module/course is used in the following study programme/s as well N/A
8.	 Responsibility for module/course 1. Prof.Dr.Ir. Hendrawan Soetanto, M.Rur.Sc. 2. Prof.Dr.Ir. Siti Chuzaemi, MS, IPU, ASEAN Eng. 3. Prof.Dr.Ir. Hartutik, MP, IPU, ASEAN Eng. 4. Prof.Dr.Ir. Kusmartono 5. Dr.Ir. Mashudi, M.Sc. Agr. 6. Dr.Ir. Marjuki, M.Sc.
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NON-RUMINANT FEED DEVELOPMENT STRATEGY									
Modu	ile/Cours	Student	Credits		Semes	ter	Frequency		Duration
e Cod	le	workload	3 SC	CU	1 st		Each	-	1 Semester
PEN80005		228 hours			semest	er	Semester		
1.	Types of	courses		Contac	t	Inde	pendent	Cl	ass size
	Elective C	ourses		hours		stud	ÿ	20	0-25
				48 hour	S	180	hours	st	udents
						Strue	ctural		
						assig	ment 100		
						hour	S		
						inde	pendence		
						stud	y 80 hours		
2.	Prerequis	ites for partici	patio	n					
	-								
3.	Learning	outcomes				_			
	1. Arrang	e and communi	cate i	deas, scie	ntific idea	as and	opinions res	por	isibly and are
	based of	on academic eth	ics ar	nd commu	inicate th	e resu	lts of livesto	ck ii	ndustry
	researc	ch in a forum (II	LO2)						
	2. Identif	y the scientific f	ields	that are t	he object	of rese	earch and po	siti	on them into a
	researd	ch map develop	ed thi	rough an i	nter and	multi-	disciplinary	app	roach (ILO6)
	3. Have the	he ability to util	ize ap	plication	or softwa	are in a	animal husba	ndı	ry field (ILO8)
4.	Subject aims/content								
	This course discusses the efforts to improve the quality and effectiveness of								
	feeding non-ruminants, including aspects of supply and quality of local feed raw								
	materials, application of microbial-based feed additive technology, substantive								
	active su	bstances and	meta	abolic su	ibstance	s, fee	ding strate	gie	s related to
	environmental problems and agricultural locations, increasing nutritiona					g nutritional			
	efficiency, through the concept of Nutribiome, meta-analysis studies on aspects								
	of nutrition and non-ruminant animal feed, as well as reviewing non-ruminant								
_	teed formulations.								
5.	1 eacning	methods							
	1. Speech								
	Z. Project	Base Learning							
	3. Case Ba	ase Learning							
	4. Group	Discussion							
6	Assessme	nt methods							
0.	1. Individ	lual work							
	2 Group	work							
	2. 010up	WOIK							
7.	This modu	ule/course is u	ised i	n the foll	owing st	tudy p	rogramme/	's a	s well
	N/A				-				
8.	Responsib	oility for modu	le/co	ourse					
	1. Dr.	Irfan H.Djunaid	li. MS	c. IPM. AS	EAN Eng				
	2. Dr.	Osfar Sjofjan, M	1Sc.IP	U.ASEAN	Eng				
	3. Pro	of. Dr.Ir.M. Halin	n Nat	sir, SPt.MI	P.IPM.ASE	EAN Er	ıg		

	4. Dr.Ir. Eko Widodo MAgr.Sc.MSc
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FORAGE DEVELOPMENT STRATEGY										
Module/Cou		Student	Crea	dits Semes		er Frequency		Duration		
rse	Code	workload	3 SCI	J	1 st sem	ester	Each		1 Semester	
PE	PEN80006 228 hour					-	Semester			
1.	Types of c	courses		Contac	t hours	Independent		Cla	Class size	
	Elective Co	ourses		48 hours		study		20-25		
						180 hours		students		
						Structural				
						assigment 100				
						hour	S			
						inde	ndependence			
						study	780 hours			
2.	Prerequisi	tes for particip	pation	l						
2	-									
3.	Learning o	outcomes				,		.1	, ,	
	1. Arrange	e and communic	cate id	eas, scier	itific ideas	s and of	pinions respo	nsit	ly and are	
	in a for	m academic ethic m (II Ω^2)	ics and	i commu	incate the	results	S OI IIVESLOCK	muu	isti y research	
	2 Able to	master the live	stock i	ndustrví	heory (sn	ecifica	lly breeding f	eed	ing and	
	management, animal product technology and agribusiness) and have ability to									
	develop	o competitive lo	cal res	ources (I	LO3)		2		2	
	3. Able to	apply innovativ	ve, mu	tidiscipli	nary techi	nology	in the develo	pme	ent of the	
	livestoc	k industry (ILO	4)							
1	Subject air	nc/contont								
ч.	This cours	ns/content	ha ra	le of sci	onco Th	is cou	rea discusse		trategies for	
	increasing production and availability of animal forage including									
	intensive/monoculture mixed cronning systems vortical farming									
	phytoreme	diation. pla	nting	and	the eff	iciency	v/accuracy	foi	r livestock.	
	Furthermore. Analysis of the forage production systems and measurement of the									
	capacity of extensive and intensive areas.									
5.	5. Teaching methods									
	1. Speech									
	2. Project Base Learning									
	3. Case Base Learning									
	4. Group I	Discussion								
	Accoremor	t mothodo								
6	Assessiner	nt methous								
0.	2 Group v	work								
	2. droup (VOIK								
	This modu	le/course is u	sed in	the follo	owing stu	dy pro	ogramme/s a	as w	vell	
7.	'. N/A									
	Responsib	ility for modul	le/cou	irse						
8.	1. Pro	f. Dr.Ir. Ifar Sub	agiyo.	M.Agr.St.	(Coordina	ator)				
	2. Dr.I	r. Hermanto, M	P	5		,				
	3. Dr.I	r. Siti Nurul Kai	naliya	h, MP						
	4. Dr.I	r. Herni Sudarw	vati, M	S						

	Ot	her information (References)
9.	1.	Yeşil, V. and Ö. Tatar. 2020. An Innovative Approach to Produce Forage Crops : Barley
		Fodder in Vertical Farming. Scientific Papers. Series A. Agronomy, Vol. LXIII, No. 1,
		2020ISSN 2285-5785; ISSN CD-ROM 2285-5793; ISSN Online 2285-5807; ISSN-L
		2285-5785.
		https://www.researchgate.net/publication/345779976_AN_INNOVATIVE_APPROAC H TO PRODUCE FORAGE CROPS BARLEY FODDER IN VERTICAL FARMING SYSTE
		M
	2.	Naik, P.K., B.K. Swain and N.P. Singh. 2015. Review-Production and Utilisation of Hydroponic Fodder. Indian I.Anim.Nutr. 32(1):1-9.
	3.	Kumar, R. M. Mathur, M. Karnani, S. Dutt, Choudhary and D. Jain. 2018. Hydroponics:
	0.	An alternative to cultivated green fodder: A review. J. Entomol.Zool. Stud. 6(6): 791- 795
	4.	Barth, S. 2012. Breeding strategies for forage and grass improvement. Annals of Botany 110 (6): 1261-1262
	5.	Acquaah, G. 2007. Principles of plant genetics and breeding. Blackwell Publishing. Victoria. Australia.
	6.	Tasma, I.M. 2015. Pemanfaatan teknologi sekuensing genom untuk mempercepat program pemuliaan. J. Litbang Pert. Vol. 34 No. 4 : 159-168.
	7.	Kalantari, F., Mohd Tahir, O., Mahmoudi Lahijani, A., & Kalantari, S. (2017). A Review of Vertical Farming Technology: A Guide for Implementation of Building Integrated Agriculture in Cities. <i>Advanced Engineering Forum</i> , 24(October), 76–91. http://doi.org/10.4028/www.scientific.net/aef.24.76
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	9.	Maria Royston, R., & M.p, P. (2018). Vertical Farming: a Concept. <i>International Journal of Engineering and Techniques</i> , <i>4</i> (3), 500–506. Retrieved from http://www.ijetjournal.org
	10	. Shafi, U., Mumtaz, R., García-nieto, J., & Hassan, S. A. (2019). Precision Agriculture Techniques and Practices : From Considerations to Applications. <i>Sensors</i> , <i>19</i> (3796), 1–25. http://doi.org/10.3390/s19173796
	11	Attwood, G.T., S.A.Wakelin, S.C.Leahy, S.Rowe, S.Clarke, D.F.Chapman, R.Muirhead and M.E.Jacobs. 2019. Application of the Soil, Plant and Rumen Microbiomes in Pastoral Agriculture. Front. Nutr., 16 July 2019 https://doi.org/10.3389/fnut.2019.00107
	12	BusbyPE,Soman, C,Wagner, MR,Friesen, ML,Kremer, J,Bennett A,etal. 2017.Research priorities for harnessing plant microbiomes in sustainable agriculture. PLoSBiol15(3): e2001793. https://doi.org/10.1371/journal.pbio.2001793

Department of Animal Product Technology Compulsory Courses
ANIM	ANIMAL FOOD BIOTECHNOLOGY									
modu	ule/	Student	Credits	Semester		Frequency		Duration		
COURS PET 8	se code 30001	228 hours	3 SCU	1 st Sem.	Each Semester			1 Semester		
1	Types of	courses	Contact	hours	Cla	Class size				
	Compulso	ory course	48 hours	S	180	hours	20-	25 students		
					Stru	ctural assignment				
					100	hours				
					1nde 80 h	ours				
2	Prerequ	isites for particij	pation (if ap	plicable)						
	-									
2	Loomin									
3	1. Stude	nts are able to ex	plain the prim	nciples of bio	otech	nology				
	2. Stude	nts are able to exp ods in livestock r	plain enzyme	es, fermentat	tion t	echnology, genetic	engi	ineering, and		
	produ	iced by biotechno	logy process	es	3 000		iu 50			
	3. Stude proce	nts are able to ap ssing of livestock	ply knowled products	lge of bioted	hnol	ogy to real proble	ms r	egarding the		
	4 . Stude	nts are able to de	velop biotecl	nnology in p	roces	ssing livestock prod	ducts	5		
4	Subject a	aims/Content	l							
	fermenta regulate	tion and enzyme	te students v technology, roducts from	, genetic en biotechnol	erstai ginee ogy p	ering in livestock	pies prod	ucts and how to		
5	Teaching	g methods								
	1. Speed 2. Proje	n ct Based Learning								
	3. Case l	based learning								
6	Assessm	ent methods								
	1. Indivi	dual work								
_	2. Group	o work	11 6			,				
7	This mo	dule/course is us	sed in the fo	llowing stu	dy p	rogramme/s as w	ell			
8	Respons	ibility for modul	e/course							
	Dr. Khoti	bul Umam Al-Awv	valy,S.Pt., M.	Si						
9	Other in	formation								
	1. Primr	ose, S.B. (1987). N	Aodern Biote	echnology. L	ondo	n: Blackwell Scient	tific F	Publications.		
	2. Thien editio	nan, William.J., an n. Boston: Pearso	d Palladino, I n.	Michael, A. (2	2013). Introduction toB	ioteo	chnology. 3rd		
	3. Baret New I	, J.M., Peter Abran ersey	noff, Kumara	n, A.K., and M	Aillin	ngton, W.F. (1986).	Biolo	gy. Prentice Hall:		

4.	Higgins, I.J. (1985). Biotechnology Principles and Applications. London:Blackwell Scientific Publications.
5.	Raven, P.H. (1986). Biology. New York: Times Mirror/Mosby College Publishing.

DESIG	N AND PROC	ESSES ANIMAL	PROD	DUCTS					
Modul	e/Course	Student	Credits		Semeste	er	Frequency		Duration
Code	-	workload	3 SCU		1 st seme	ster	Each		1 Compostor
PET 80	002	228 hours					Semester		1 Semester
1	Types of co			Contact	oure	Indon	ondont	Cl	
1.	Compulsor	a Courses		40 hours independent class st					-25 students
	compuisory	y courses		40 11001 5		stuuy		20-25 students	
						180 h	ours		
						Struct	ural		
						assign	ment 100		
						hours			
						Indep	endence		
						study	80 hours		
2.	Prerequisit	es for participation	on						
	-								
3.	Learning ou	itcomes							
	1. Student	s are able to und	erstar	nd the desig	gn compo	nents o	f livestock foc	od p	rocesses and
	process	flow diagrams.				,			1.1
	2. Student	is are able to expl	ain th	ie optimiza	tion of the	ermal, c	hilling, freezi	ng a	ind thawing
	processes.								
	3. Students are able to develop food processing and control processes including the								
	4 Student	on process. is are able to ann		ntic nroces	s design	and pro	cess safety		
	1. Student		ly asc	pric proces	5 uc3igii, t	ina pro	cess sarcey.		
4.	Subject aim	s/content							
	This course	discusses the con	mpon	ents of anir	nal produ	ct food	process desig	gn, fl	ow diagrams of
	livestock p	product process	ing p	processes,	optimiza	tion o	f thermal p	roce	esses such as
	pasteurizat	ion and sterilizat	ion, o	ptimizatior	n of chillin	g, freez	ing and thaw	ing	processes, food
	processing	and control, extra	action	process de	esign, asep	otic pro	cess design, a	nd s	security
-	auring proc	essing.							
5.	1 eaching m	ethous							
	1. Speech	Rase Learning							
	2. Troject 3. Case Ba	se Learning							
	4. Group I	Discussion							
	ii dioup 2								
6.	Assessment	t methods							
	1. Individu	ual work							
	2. Group v	vork							
7	This modul	a/course is used	in the	following	study pro	aramm	a/s as wall		
/.	N/A	e/course is used	in the	Tonowing	study prog	grannin	e/s as well		
8	Responsibil	ity for module /o	ourse						
0.	Prof. Dr. Lil	ik Eka Radiati. M	S., IPU	J., ASEAN E	ng				
9.	Other infor	mation (Reference	ces)	, ,	0				
	1. Jasim A	hmed (Èditor), M	oham	ımad Shafiı	ır Rahmaı	n (Edito	or). Handbook	c of l	Food Process
	Design,	Volume Set 2							
	2. Food Er	ngineering Handb	ook:	Food Proce	ss Engine	ering.			
1									

REGU	JLATION O	F ANIMAL PRO	ODU	CT INDUS	TRY				
Modu	ile/Cours	Student	Cre	dits	Semes	Semester F		y	Duration
e Cod	le	workload	3 SC	CU 1 st ser		ester Each		•	1 Semester
PET 8	30003	228 hours					Semesters		
1.	Types of	courses	1	Contact	hours	Independent		Cl	ass size
	Compulso	ry courses		48 hour	S	study	v	10)-15 students
	Compaise	ry courses		10 no un		400 h	,		10 5000000
						180 h	ours		
						Struct	ural		
						assigr	iment 100		
						Indep	endence		
						study	80 hours		
2.	Prerequis	ites for partici	patio	n					
	-								
3.	Learning	outcomes							
	1. Unders	stand informatic	on rela	ated to issu	ies in Foo	od Regi	lation Affair	s.	
	2. Apply t	the principles of	prim	ary food re	egulation	for pul	olic health.		
	3. Apply p	principles of scie	entific	: inquiry in	cluding e	evidenc	e-based prac	ctice	e, auditing,
	evaluat	tion to research	and s	olve speci	fic food re	egulato	ry issues tha	t re	quire detailed
	researc	ch investigations	s.						
1	Subject air	malcontont							
4.	This cours	nis/content	o nol	icios and i	ogulatic	ne ice	und by the g	0.00	ornmont
	regarding	processed live	e pon	r product	includi	ng mil	leu by the g	ove ch	onowand
	leath on pr	processeu iive	alud	c product	tion nor	ing inin Imita i	K, Illeat, egg	5, 11 1.00	for livesteele
	neather pr	from obroad u	otori	es uisti ibt	al numb	mits, i	tification D	ies idt	
	liconcing	free mericet pe		halal y cont		ber cer	dification, P		/MD/ML
	labola	nee market po	meles	s, fialai i e	Juneme	nts, pa	ckaging leq	un	ements and
5	Tooching	mothode							
5.	1 Speech	memous							
	1. Speech	- Paco Loarning							
	2. Flojett	Dase Learning							
	J. Case Da	Discussion							
	4. Group	Discussion							
6.	Assessme	nt methods							
	1. Individ	ual work							
	2. Group	work							
7	This modu	ulo/courso is u	sod i	n tha falla	wing sti	idu pr	ogrammo /s	26.1	woll
/.	N/A	lic/course is u	scu n		wing stu	iuy pro	Jgi annie/ S	as	wen
8.	Responsil	vility for modu	le/co	urse					
0.	1. Pro	of. Dr. Ir. Lilik F	Eka R	adiati. MS	IPU				
	2. Pro	of. Dr. Ir. Dialal	Rosv	vidi. MS I	, PU., ASE	AN En	g		
	3. Dr.	. Ir. Purwadi. M	IS	. ,0., 1	- ,-101		0		
	4. Dr.	. Ir. Mustakim	MP	IPM					
	5. Dr.	. Ir. Imam Thol	iari. I	MP., IPM	ASEAN 6	eng			
	6. Dr.	Ir. Manik Eirr	v Saw	vitri. MS		0			
	7. Dr.	Ir. Aris Sri Wi	dati.	MS					
	8. Dr.	. Ir. Env Sri Wi	dvati	MP					
	8. Dr. Ir. Eny Sri Widyati, MP								

	10.	Dr. Khotibul Umam Al-Awwaly, S.Pt., M.Si
	11.	Dr. Ir. Agus Susilo, S.Pt., MP., IPM., ASEAN Eng
	12.	Dr. Herly Evanuarini, S.Pt., MP
	13.	Dr. Dedes Amertaningtyas, S.Pt., MP
9.	Othe	er information (References)
	1. Ja	asim Ahmed (Editor), Mohammad Shafiur Rahman (Editor). Handbook of Food
	F	Process Design, Volume Set 2
	2. F	Food Engineering Handbook: Food Process Engineering

Department of Animal Product Technology Elective Courses

TECHN	NOLOGY O	F MEAT, LEATH	ER AND) BY-	PRODUCT I	NDU	ISTRY			
modu cours code PET 8	ile/ se	Student work- load 228 hours	Credi 3 SCU	ts	Semester 2 nd Sem.		Frequency Each Semester		Duration 1 Semester	
1	Types of	courses	Со	ntact	hours	Inc	dependent study	Cla	ss size	
	Elective	course	48	hours	180	hours	20-	25 students		
						Stru 100	ictural assignment hours			
				Ind 80 h		lependence study nours				
2	Prerequ	isites for partici	pation	(if ap	plicable)					
3		g outcomes	nlain in	ductr	ial dovolopy	mont	ts and most produc	+ lo	athor and by	
	r. Stude produ	icts	piani in	luusu	lai uevelopi	mem	is and meat produc	<i>.</i> t, iea	attier allu by-	
	2. Stude	nts are able to ex	plain th	ie stai	ndardizatio	n of 1	meat-based food pr	odu	cts, leather and	
	by-pr 3 Stude	oducts and non-fo	ood pro lve the	ducts	em of prope	r ha	ndling of meat lear	thor	and by-products	
	incluc	ling handling befo	ore pro	cessir	ng/processi	ng ar	nd storage	liici	and by products	
	4. Stude	nts are able to de	velop p	rodu	cts from me	at, le	ather and by-prod	ucts	as well as	
	tannii	ng.	Such as	STESL	i uctui eu ine	eat, I	neat lei mentation,	IuII	y and leather	
4	Subject a	aims/Content rse aims to impro	ove stud	dents	' understan	ding	of Meat. Leather a	nd F	sy-products: This	
	course d	iscusses the indu	strial d	evelo	pment and	techi	nology of meat, lea	ther	and by-products	
	which a preparat	re important an ion of industrial	d strat raw m	tegic nateri	commoditi als to prop	es fi er e	rom the nutrition invironmental mar	al a nage	spect, from the ment, caused by	
	industry	. Selection and a	ssessm	ent o	of raw mate	erials	s, HACCP on proce	essin	ig, Handling and	
	its produ	ance of core tools icts.	and eq	uipm	ent in the in	dust	ry, as well as simpl	e tes	sting methods for	
5	Teaching	g methods								
	1. Speec 2 Proje	h ct Based Learning	r							
	3. Case l	based learning)							
6	4. Group	Discussion								
0	1. Indivi	idual work								
	2. Group	o work								
7	This mo	dule/course is u	sed in t	the fo	ollowing stu	ıdy j	programme/s as v	vell		

8	Re	sponsibility for module/course
	Pro	of. Dr. Ir. Djalal Rosyidi, MS., IPU., ASEAN Eng.
9	0t	her information
	1.	Editor: Y. H. Hui , J. L. Aalhus , L. Cocolin , I. Guerrero-Legarreta , L. M. Nollet, R. W. Purchas , M. W. Schilling , P. Stanfield , Y. L. Xiong. Handbook of Meat and Meat Processing
	2.	Soeparno. Ilmu dan Teknologi Daging
	3.	Hari Purnomo. Ilmu dan Teknologi Pengolahan Daging
	4.	Fidel Toldra. Handbook of Meat Processing
	5.	Suharjono Triatmojo dan M. Zainal Abidin: Penyamakan Kulit Ramah Lingkungan, UGM Press
	6.	Stephanie Clark (Editor), Stephanie Jung (Co-Editor), Buddhi Lamsal (Co-Editor). Food Processing: Principles and Applications, 2nd Edition
	7.	Gelatin Manufactures Institute Of America (GMIA), 2012. Gelatin Handbook. Written and produced by the members of the GMIA.
	8.	Immeson, A. 1999. Thickening and Gelling Agents for Food. Aspen Publisher Inc. New York.
	9.	Ockerman, H.W., and C.L. Hansen. 2000. Animal By Products Processing and Utilization. CRC Press. USA.
	10.	Schrieber, R., and H. Gareis. 2007. Gelatine Handbook.Theory and Industrial Practice. Wiley-VCH Verlag GmbH & Co. KGaA. Weinham. Germany.
	11.	de Wolf, F.A. 2003. Collagen and Gelatin. Progress in Biotechnology, Elsevier Science B.V, Amsterdam, Netherlands, 133-218
	12.	Jurnal BBKKP (Balai Besar Kulit Karet dan Plastik) Yogyakarta
	13.	Meat Science - Journal Elsevier
	14.	The Journal of the American Leather Chemists Association : JALCA

TECH	NOLOGY (DF DAIRY AND	BY-	PRODUC	TS INDU	STRY				
Modu	lle/Cours	Student	Cre	dits	Semester		Frequenc	y	Duration	
e Cod	e	workload	3 SC	CU	1 st sem	ester	Each		1 Semester	
PET8	0005	228 hours					Semester			
1.	Types of	courses		Contact	hours	Inde	pendent	Cl	ass size	
	Elective C	ourse		48 hours	S	stud	y	20)-25 students	
						180 h	ours			
	Structural									
						assigr	nment 100			
						hours				
						Indep	endence			
2	Proroquis	ites for partici	natio	n		Sludy	00 110015			
۷.	-	ites for particip	Jatio	11						
3.	Learning	outcomes								
	1. Studen	ts are able to un	derst	and the di	rection of	f natior	nal milk polic	y		
	2. Studen	ts are able to ex	plain	the proper	r handlin	g of mi	lk before pro	cess	sing	
	3. Studen	ts are able to ex	- xplair	about pr	oducts fr	om mil	k, by-produc	ts a	and processing	
	techno	logy	-	-						
	4. Students are able to understand the aseptic processing and packaging of dairy									
	products and their by-products									
	5. Studen	ts are able to exp	olain	the standa	rdization	of milk	-based food	pro	ducts and their	
	by-pro	ducts.						-		
4.	Subject air	ms/content				_				
	This cours	se discusses re	lated	to nation	al dairy a	and in	ternational	trac	de, the	
	process of	processing mi	lk w	hich is an	importa	nt and	strategic co	mr	nodity from	
	the aspect	and fulfillmen	tofr	iutrition f	or the co		hity in the ir	idu:	stry, starting	
	irom the p	preparation of	adda	strial raw	materia	is to th	le proper na	nai	ing of by-	
5	Tooching	mothods	auue	eu value.						
5.	1 Sneech	ineulous								
	2 Project	Raco Loarning								
	2. Troject									
	J. Case Da	Diaguagian								
	4. Group	Discussion								
6.	Assessme	nt methods								
	1. Individ	ual work								
	2. Group	work								
		1 (.1			,			
7.	This modu	ale/course is u	sed i	n the follo	wing stu	idy pro	ogramme/s	as	well	
0	N/A Doctore and 1	ility for so a l	0/00	1180.0						
ð.	Responsit	Duity for modul	e/co י מא	ULSE	AN Ena					
0	Othoninfo	s susilo, S. Pt, I	vir., I	$(\Gamma M, ASE)$	hin Elig.					
7.		miliacion (Refe	ence	:5]						

1.	Murlidhar Meghwal, PhD (Editor), Megh R. Goyal, PhD, PE (Editor), Rupesh S.
	Chavan, PhD (Editor). Handbook: Dairy Engineering Advanced Technologies and
	Their Application.

TECH	NOLOGY OF	EGG AND HON	EY IN	IDUSTRY					
Modu	le/Cours	Student	Cre	dits	Semester		Frequency		Duration
e Cod	e	workload	3 SC	CU	1 st sem	ester	Each		1 Semester
PET 8	0006	228 hours					semester		
1.	Types of	courses		Contact	hours	Inde	pendent	Cla	ass size
Elective Courses				48 hours	5	stud	v	10)-15 students
						180 ł	iours		
2.	Prerequis	ites for partici	oatio	n					
	-	I I I I							
3.	Learning of	outcomes							
_	1. Studen	ts are able to ex	plain	the function	onal prop	erties o	of eggs, the d	evel	lopment of
	added value of egg products, processes and equipment								
	2. Studen	ts are able to de	velor	technolog	y for the	fresh e	egg industry a	and	egg
	processing industry, quality control and assurance								
	3. Studen	ts are able to ex	plain	the physic	ochemica	al, micr	obiological a	nd b	oiochemical
	proper	ties of honey an	d ana	lyze the qu	ality test	ing of l	honey, propo	lis, l	bee poolen,
	and royal jelly								
	4. Studen	ts are able to ex	plain	the techno	logy and	indust	ry of honey, j	prop	polis, bee
	poolen, and royal jelly								
Λ.	Subject ai	ms/content							
т.	The Foo	and Honey Inc	luctr	v Techno		irco di	scusses the	Δσ	a and honey
	industry	which is an in	nort	ant and a	strategic	comn	nodity from	th	e aspect and
	fulfillment	+	iport		strategie	comm	nouncy monn		e aspect and
	nutrition	for neonle in	indu	stry from	the nre	narati	ion of raw	mat	terials to the
	nroner ha	ndling of the e	nvirc	nment ca	used by	the ind	dustry	mat	terrais to the
5	Teaching	methods		/inficine ca	useu by		austry.		
5.	1 Sneech	methous							
	2 Project	Base Learning							
	3. Case Ba	ase Learning							
	4. Group	Discussion							
	ii droup								
6.	Assessme	nt methods							
	1. Individ	lual work							
	2. Group	work							
7	This modu	ile/course is in	sed i	n the follo	wing str	idy nr	noramme/s	25 1	well
<i>,</i> .	N/A	ane, course is a	Jeu I	in the rono	wing see	iuy pro	ogramme/s	us v	WCII
8.	Responsil	nility for modul	le/co	urse					
0.	1. Dr. Ir. Ir	nam Thohari. I	MS. II	PM Asean	Eng				
	2. Dr. Hei	rly Evanuarini.	SPt.	M.P.	28				
9.	Other info	ormation (Refe	rence	es)					
	1. Stadelr	nan. W.I Newki	rk. D	and L.New	bv. 1995	. Egg Sa	cience and te	chno	ology, CRC
	Press	,, .,	, 2			-00 5			
	2. Nys, Y.,	Bain, M., and F.	V. Im	merseel. 20)11. Impi	oving	the Safety an	d Qı	uality of Eggs
	and Eg	gs Products.			P	0	-,	C.	- 00-
	3. Hester,	, P. 2017. Egg ind	ovatio	on and stra	tegies for	r Impro	oements. Aca	dem	nic Press.
						-			

Department of Livestock Agribusiness Compulsory Courses

AGRI	AGRIBUSINESS SUPPLY CHAIN MANAGEMENT									
modu cours code 8000	ıle/ se PES 1	Student work-load 228 hours	Credits 3 SCU	s Semester 1 st Sem.		Frequency Each Semester		Duration 1 Semester		
1	Types of	courses	Contact	hours	Inc	lependent study	Cla	ss size		
	Compulsory course		48 hour	S	18	0 hours	20-	20-25 students		
	F F	,		-	Str ass ho	Structural assignment 100 hours				
					Inc 80	lependence study hours				
2	 Prerequisites for participation (if applicable) - 									
3	 Learning outcomes 1. Students are able to formulate the concept of livestock agribusiness supply chain management 2. Students are able to design supply chain concepts that can improve the competitiveness of livestock agribusiness 3. Students are able to design a supply chain model that can be integrated with information 									
4	Subject a	aims/Content								
	This coun the conce and Strat and integ Supply C Collabora Supply C Chain to 4.0 vs Ne	rse aims to improvent of Integrated S tegic Lead Time M grated corporate s hain and Chain, E ation of Informati hain and Concept Networked Supply w Normal Era	ve student s Supply Chair Management Systems, the Systems, the Systems	kills in aspect and Compe , Informatio core conce alue Networ ogy between atrix in Virtu Case Study :	cts of titiv n Te pt of k, St cor ual V Sup	f Competitive adva e Advantage, Supp chnology in Suppl F e-SupplyChain, B rategy of Integration npanies, Concept of alue Chain, shiftin ply Chain Manager	ntag ly Ch y Ch -to-E ing T of Di g fro nent	e, understanding nain Management a Landscape in e- Two Systems and gital Economy in om Linear Supply in Industrial Era		
5	Teaching methods 1. Speech Speech 2. Project Based Learning Speech 3. Case based learning Speech 4. Group Discussion Speech									
6	Assessm	ent methods								
	1. Indivi	idual work								
	2. Group	o work								
7	This mo	dule/course is us	sed in the fo	ollowing stu	ıdy p	programme/s as v	vell			
8	Respons	ibility for modul	e/course							
	Ir. Hari Dwi Utami , MS., M.AppL.Sc., Ph.D., IPM.,ASEAN Eng.									

9	Other information
	Collins,R.,Dunne,T.A, Murray,A.P. 2004. Forming and Managing supply chain in agribusiness : learn from others. Department of Agriculture, fisheries and forestry development. Leraning
	CD. Australian.
	Mentzer,J.T. 2004. Fundamentals of Supply Chain Management : twelve drivers of competitive advantage. Sage publication. Thousand oaks. CA
	Roekel,JV. Williems S & Boselie, DM. 2002. Agri-Supply Chain Management - to stimulate cross border trade in developing countries and emerging economics. Washington DC, World bank.

AGRIBUSINESS POLITICS AND POLICY									
modu	ıle/	Student	Credits	Semes	ter	Frequency		Duration	
cours	Se DFS	work-load	3 SCU	1 st Ser	n.	Each Semester		1 Semester	
8000	80002								
1	Types of	courses	Cont	act hours	In	dependent study	Cla	ss size	
	Compulsory course		48 ho	48 hours		180 hours		20-25 students	
					5	Structural			
					assignment 100				
					r	iours			
					l S	Independence study 80 hours			
2	Prerequ	isites for partici	pation (i	applicabl	e)				
	-								
3	Learning	goutcomes							
	1. Stude	nts understand th	ne concep	t of Politics	and Po	licies of livestock A	grib	usiness	
	2. Stude	nts are able to ide	entify pro	blems and	politica	l prospects and live	stoc	k agribusiness	
	3 . Stude	es. Ints understand th	ne regulat	ion of lives	tock ag	rihusiness			
4	Subject a	aims/Content							
	This cour	rse aims to impro	ve studer	t skills thro	ugh asp	pects of understand	ing a	agribusiness,	
	agribusin	ess structures, ag	gribusine	s developn	nent mo	odels, agribusiness j	prob	lems and	
5	Teaching	s, and agribusilies	ss policie.	•					
	1. Speed	:h							
	2. Proje	ct Based Learning	5						
	4. Group	Discussion							
6	Assessm	ent methods							
	1. Indivi	idual work							
	2. Group	o work							
7	This mo	dule/course is u	sed in th	e following	study	programme/s as v	vell		
0	Derr	:h:12	1 a / a = 1						
8	Respons	ibility for modul	le/cours						
	DI. II. Su	prin banbang Sis	wijono, i	15.					
9	Other in	formation							
	Agricultu	ral Policies in De	veloping	Countries. J	ounal A	gicultural Economi	cs. M	lay 1993.	

Bechtold, K.W. 1988. Politik dan Kebijaksanaan Pembangunan Pertanian. Terjemahan. Yayasan Obor Indonesia. Jakarta.
Mosher, A.T. 1991. Menggerakkan dan Membangun Pertanian: Syarat-syarat Pokok Pembanagunan dan Modernisasi., Cetakan Ke 13. C.V. Yasaguna. Jakarta.
Perundangan dan Peraturan Peternakan tentang Kesehatan Hewan dan Peternakan serta Kesehatan Masyarakat Veteriner

STRATEGIC MANAGEMENT OF LIVESTOCK AGRIBUSINESS											
modı	ıle/	Student	C	redits	Semester		Frequency		Duration		
cours	Se DEC	work-load	3	SCU	1 st Sem.		Each Semester		1 Semester		
coae 8000	PES 3	228 hours									
1	Types of	f courses	1	Contact	hours	Inc	dependent study	Cla	ss size		
	Compulso	ory course		48 hours	5	180 hours		20-	20-25 students		
				10 110 111		Structural					
						as	ssignment 100				
			h	ours							
						Ir	ndependence				
	_					st	udy 80 hours				
2	Prerequ	isites for partici	pat	tion (if ap	plicable)						
	-										
3	Learning	goutcomes									
	1. able t	o critically evalua	ite	and apply	strategic ma	anag	gement in livestock	agri	business.		
	2. able t	to analyze externation of the second s	il ai	nd interna	al factors of I	ives nnlu	tock agribusiness (ving strategic mana	comp Igem	oanies ent methods in		
	strate	egy making, analy	sis	and imple	ementation).	ppiy	ing strategie mane	igem	ent methous m		
	3. able t	o solve problems	an	d make ar	alytical stra	tegi	c decisions in lives	tock	agribusiness		
	4. Able t	to decide, compile	e ar	nd suggest	adequate liv	vest	ock agribusiness st	trate	gies		
4	Subject a	aims/Content									
	The focus	s of strategic ma	na	gement h	as shifted f	rom	business policy	towa	ards competitive		
	been chai	nged from focus	ing	g on long	g-term plan	ning	tive force mode	el a	nalysis, strategic		
	advantage	es, core compete	nci	ies, and l	olue ocean	stra	, tegy, to combinin	ng fl	exible corporate		
	strategies	that are suitable	for	modern e	environment	s wł	hich is changing raj	pidly	r.		
	The cours	e material introd	uce	es student	s to the con	cept	t of strategic mana	igem	ent. Through the		
	strategy d	esign process, stu	ıde	ents are in	troduced to	the	mission, vision an	d ap	proach to setting		
	strategic g	goals. Methods for	r ev	valuating	external fact	ors	and competitivene	ess a	s well as internal		
	analysis).	Different busir	nes:	s strateg	ies (expans	sion.	mergers and a	acqui	isitions, vertical		
	integratio	n, diversification). S	trategy se	election and	ana	lysis includes the	appl	ication of SWOT,		
	SPACE, BO	CG and QSPM ma	triz	x. The cor	e objectives	of	this course are to	und	erstand strategic		
	pianning p develop k	processes, concep	ts, 1 to	and tools	and be able t	to ar cki a	gribusiness sector	n bu . wh	siness situations,		
	driving for	rces of change, in	dus	stry trend	s, and indust	try s	cope, develop and	perf	ecting analytical,		
	communio	cation and team w	or	k skills.							
5	Teaching	g methods									
	2. Proje	ct Based Learning	ŗ								
	3. Case	based learning	,								
	4. Grouj	p Discussion									
6	Assessm	ent methods									
	1. Indiv	idual work									
	z. Grou	2. Group work									

7	T	his module/course is used in the following study programme/s as well
8	R	esponsibility for module/course
	1 .]	Dr. Ir. Bambang Ali Nugroho, MS., DAA.,IPM., ASEAN Eng
9	0	ther information
	1.	Wheelen, Thomas L. 2012. Strategic management and business policy : toward global sustainability
	2.	Thomas L. Wheelen, J. David Hunger. — 13th ed. Copyright $@$ 2012, by Pearson Education, Inc., publishing as Prentice Hall.
	3.	David, Fred R. 2011. Strategic management: concepts and cases / Fred R. David.—13th ed. Copyright © 2011, by Pearson Education, Inc., publishing as Prentice Hall, One Lake Street, Upper Saddle River, New Jersey 07458.
	4.	Thomas H. Davenport, Marius Leibold and Sven Voelpel. 2006. Strategic Management in the Innovation Economy. Strategy Approaches and Tools for Dynamic Innovation Capabilities. © 2006 by Publicis KommunikationsAgentur GmbH, GWA, Erlangen.
	5.	White, Colin. 2004. Strategic management. First published 2004 by PALGRAVE MACMILLAN

Department of Livestock Agribusiness Elective Courses

SOCIA	SOCIAL ENGINEERING									
modu	ıle/	Student	Credits	Credits Semester		Frequency		Duration		
cours code	se	228 hours	3 SCU	2 nd Sem.		Each Semester		1 Semester		
PES 8	0004	220 11001 5								
1	Types of	courses	Conta	ct hours	Inc	dependent study	Cla	iss size		
	Elective o	course	48 hou	ırs	18	180 hours		20-25 students		
						Structural assignment 100 hours				
						Independence study 80 hours				
2	Prerequ	isites for partici	pation (if	applicable)						
	-									
3	Learning	goutcomes								
	1. Stude	nts understand th	ne concept	s of social char	nge a	and social-capital.				
	2. Stude agrib	nts are able to ide usiness.	entify socia	ll-capital and i	its ro	ole in the developm	ient	of livestock		
	3. Stude livest	nts understand th ock agribusiness.	ne regulatio	ons and provis	sions	s related to institut	iona	l development in		
	4. Stude	nts understand th	ne principle	es of social an	alysi	is related to the int	eres	ts of social		
	5 Stude	eering and suppo	sign and n	arrate institut	uev iona	l work mechanism	с in	accordance with		
	the lin	nes and segmenta	tion in live	stock agribus	ines	s.	5 111			
	6. Stude instit	nts understand a utional developm	nd are able ent in lives	to develop in tock agribusii	dica 1ess	tors for assessing s	socia	ll and		
4	 institutional development in livestock agribusiness. Subject aims/Content This course includes activities to provide students with an understanding in identifying and mapping existing social situations related to the nodes of activities in the livestock sector; then students can work on institutional intervention opportunities for livestock agribusiness development in accordance with agribusiness interests, the dynamics of social change and applicable regulations. Based on the intended objectives, the lectures are given materials: Understanding of social change and social-capital, Production-regime and organization of production, Social-analysis, Sustainable-Livelihoods approach and analysis, Regulations and policies for the development of livestock agribusiness , Land-tenure systems and livestock agribusiness, SDGs in agriculture-livestock, Climate change and smart-agriculture, Concepts of sovereignty and food security, Internet of things (IoT) in agriculture, Social inclusion and gender in agriculture, Agribusiness development with millennial youth, as well as research and development agenda of social institutions in agribusiness. Teaching methods Speech Project Based Learning One then there is a subsect of the sector. 									
6	Assessm	ent methods								
-	1. Indivi	idual work								

	2. Group work
7	This module/course is used in the following study programme/s as well
8	Responsibility for module/course
	Dr. Ir. Priyo Sugeng Winarto, MA.
9	Other information
	FAO, 2014, Social analysis for agriculture and rural investment projects, FAO-Rome.
	FAO, 2018, Social network analysis for territorial assessment and mapping of Food Security and Nutrition Systems (FSNS) : A methodological approach, FAO-Rome.
	FAO, 2001, Socio-Economic and Gender Analysis Programme, SEAGA, FAO-Rome.
	FAO, 2016, Strengthening coherence between agriculture and social protection to combat poverty and hunger in Africa : Framework for Analysis and Action, FAO-Rome.
	Appadurai, Arjun. 1996. Modernity at Large: Cultural Dimensions of Globalization. Minneapolis: University of Minnesota Press.
	Tirivayi, N., Marco Knowles, M. and Davis, B., 2013, The interaction between social protection and agriculture : A review of evidence, FAO-Rome.
	Bryant, C.R., 2012, The social transformation of agriculture: the case of Québec.
	Allen, D.W. and Lueck, D., 2003, The Nature of the Farm Contracts, Risk, and Organization in Agriculture, The MIT Press Cambridge, Massachusetts London, England.
	Rehber, E., 2007, Contract Farming : Theory and Practice, The ICFAI University Press, Hyderabad, India.

LIVESTOCK BUSINESS COMMUNICATION									
modı	ıle/	Student	Credits	Semester		Frequency		Duration	
cours	se	work-load	2 SCU	2 nd Sem.		Each Semester		1 Semester	
	20005	152 hours							
1	Types of	COURSES	Contact	hours	Inc	lenendent study	Cla	ss size	
1	Floctivo		22 hours	22 hours		120 hours		20.25 students	
	LIECTIVE	Louise	52 Hours	52 IIOUI S				20-25 Students	
						structural assignment 53,33 hours			
					Independence study 66,67 hours				
	_								
2	Prerequ	isites for particip	pation (if ap	oplicable)					
	-								
-									
3		goutcomes	molato hugin			ion with agricultur	al d	avalanmant	
	1. Stude 2 Stude	ents are able to co	tail the com	nonents in th	ncat ne co	mmunication system	em ii	n the livestock	
	busin	ess				initialiteaction syst		T the hvestock	
	3. Stude busin	nts are able to an ess	alyze the rol	e and contri	buti	on of actors involve	ed in	the livestock	
	4. Stude effect	nts are able to for ive communicatio	rmulate mest on in the live	sages in com stock busine	imur ess	nication so that the	y ar	e able to realize	
	5. Stude comm	nts are able to de nunication	sign effectiv	e methods, n	nedi	a and technology in	n live	estock business	
	6. Stude	nts are able to de	sign and eva	luate comm	unic	ation systems in th	e liv	estock business	
	7. Stude	nts are able to an	alyze and int	terpret comr	nuni	ication in supply cl	nain	activities	
4	Subject a	aims/Content	the concen	t of husiness	con	munication in ani	məll	husbandry which	
	includes	s a basic understa	nding of agri	cultural dev	elop	ment, communicat	ion s	systems, actors in	
	busines	s, communication	messages,	message de	liver	y methods, media	and	l communication	
F	and con	imunication techi	nology in sup	oporting sup	ply (chains			
Э	1. Speed	ch							
	2. Proje	ct Based Learning	5						
	3. Casel	based learning							
6	Assessm	ent methods							
Ũ	1. Indivi	idual work							
	2. Group	o work							
7	This mo	dule/course is us	sed in the fo	ollowing stu	ldy p	orogramme/s as v	vell		
	1.								
8	Respons	ibility for modul	e/course						
	Dr. Siti Azizah,S.Pt.,M.Sos.,M.Commun.								

9	Other information
	Bisen, V and Priya. (2009) Business Communication. New Age International (P) Limited, Publishers. New Delhi.
	Barnard, F., Akridge, J., Dooley, F., and Foltz, J. (2012) Agribusiness Management. Routledge New York.
	Kurtzo, Fawn; Hansen, Maggie Jo; Rucker, K. Jill; and Edgar, Leslie D. (2016) "Agricultural Communications: Perspectives from the Experts," Journal of Applied Communications: Vol. 100: Iss. 1. https://dx.doi.org/10.4148/1051- 0834.1019
	Hagiu, A and Bărbulescu, M. (2014) Communication - A Key to Agribusiness Success. Lucrări Științifice, Seria I, Vol.XVI (2) pp.53-58

AGRIBUSINESS RISK MANAGEMENT										
modu	ıle/	Student	Credits	redits Semester		Frequency		Duration		
cours	se	work-load	2 SCU	2 nd Sem.		Each Semester		1 Semester		
PFS 8	80006	152 hours								
1	Types of	f courses	Contact	ct hours Ind		dependent study Cl		ss size		
	Elective	course	32 hour	S	12	0 hours	20-	0-25 students		
				-	Structural					
						assignment 53,33 hours				
					Inc 66,	lependence study 67 hours				
2	Prerequ	isites for partici	pation (if aj	oplicable)						
3	Learning	goutcomes			_		_			
	1.Explain	the concept of ris	k and uncert	ainty and th	e the	eory of decision ma	iking	5		
	2. Identify	the types of risks	s and source	s of risk in ag	gribi	isiness				
	3.Using an	alysis tools and i	nterpreting i	risk in agribi rielee	isine	ess				
4	4.Analyzii	ig strategies for d	eaning with i	TSKS.						
Ŧ	This con uncerta correlat taker, underst calculat	urse aims to imp inty, risk manag ing between risk risk neutral), id anding the types ing risky income	rove student gement, und and income, entifying and and source with several	ts' abilities in lerstanding individual b nd skilled s of Agribus methods an	n ris indiv ehav in a sines d abl	k line analysis bas vidual behavior in for in dealing with pplying corporate s risks, skilled in e to design risk ma	sed o n de risk e ris deci anag	on the concept of ealing with risk, (risk averse, risk sk management, sion making and ement strategies.		
5	Teachin	g methods								
	1. Speed	ch								
	2. Proje 3. Casel	ct Based Learning based learning	5							
	4. Group	p Discussion								
6	Assessm	ent methods								
	1. Indiv	idual work								
	2. Group	p work								
7	This mo	dule/course is u	sed in the fo	ollowing stu	dy p	orogramme/s as v	vell			
8	Respons	ibility for modu	le/course							
	Prof. Dr.	Ir. Budi Hartono,	MS. IPU. ASE	EAN. Eng						
9	Other in	formation								
	1. Tung	gal Widjaya A. 20	16. Enterpris	se Risk Mana	igem	ent. Harvarindo. Ja	akart	ta.		
	2. Darm	awi Herman. 201	6. Manaieme	en Risiko. Ed	isi 2.	. PT Bumi Aksara. I	akaı	rta.		
	3. Hery,	SE, Msi. 2016. Int	egrated Bus	iness Manag	eme	nt. PT Grasindo. Ja	kart	a.		

4.	Pratama Tony. 2011. Manajemen Risiko Bisnis. Sinar Ilmu. Jakarta.
5.	Soekartawi dkk. 1993. Risiko dan Ketidakpastian Dalam Agribisnis. Teori dan Aplikasi. PT Raja Grafindo Persada. Jakarta.
6.	Kountur . 2006. Mudah Memahami Manajemen Risiko peusahaan. PPM. Jakarta.
7.	Ali, Masyhud. 2006. Manajemen Risiko. Strategi Perbankan dan Dunia Usaha Menghadapi Tantangan Globalisasi Bisnis. PT Raja Grafindo Persada Jakarta.
8.	Darmawi, Herman. 2008. Manajemen Risiko. Bumi Aksara Jakarta

Department of Livestock Reproduction and Breeding Compulsory Courses

ANIMA	ANIMAL REPRODUCTIVE EFFICIENCY									
Modul	e/Course	Student	Cre	dits	Semest	ter	r Frequency		Duration	
Code	-	workload	3 S(CU	1 st semester		Each	1 semester		
PER80	001	228 hours					semester			
1.	Types of c	ourses		Contact	hours	Inde	pendent	Cl	ass size	
	Departmer	nt of Animal		48 hour	S	stud	V	20	20-25 students	
	Reproduct	ion and Breedi	d Breeding		10 110 110		iours			
	Compulsor	v Courses	0							
2.	Prereauisi	tes for participa	ation							
	-									
3.	Learning outcomes									
0.	200110080									
	1 Able to understand the meaning of Reproductive Efficiency and the parameters									
	1. The to understand the meaning of Reproductive Enciency and the parameters								e parameters	
	2 Able to	understand the	- haci	c science	ofrenrod	uction	which inclue		renroductive	
	2. Able to understand the basic science of reproduction which includes reproductive physiology and organized the factors that influence it in ruminants and									
	physic	<i>⁷</i>	лоду	and the	lactors t	mat m	nuclice it in	iiu	innants and	
	2 Able to understand how to provent reproductive disorders and how to manage									
	5. Able to understand now to prevent reproductive disorders and now to manage								w to manage	
	breeding enores to achieve reproductive enterency (er +)									
4	Subject of	a laontont								
4.	Subject all	a diaguagaa ah	+ +k	o atratag			raductiva of	ficia	now as that it	
	This cours	e discusses abo	JUL	ie strateg	y produc	es rep	roductive el			
	contains i	knowledge fro	m re		ve pnysi	lology	and regula	itio	n to achieve	
	reproducti	ve efficiency t	nroug	gn accelei	ating pu	berty.	Normal est	rus	cycle, mating	
	system that	at produces high	gh su	ICCESS WI	th increa	sed pi	roductivity,	pro	duces healthy	
-	Offspring u	ntil weaning, a	na no	reprodu	ctive diso	order o	ccurs			
5.	1 eaching n	netnous								
	1. Speech	Description								
	2. Project	Base Learning								
	3. Case Ba	ase Learning								
6	4. Group									
6.	Assessmen	it methods								
	1. Discuss	sion								
_	2. Presen	tation		.1	1		,		1	
7.	This modu	le/course is use	ed in	the follow	ring study	y prog	ramme/s as	wel	1	
	N/A									
8.	Responsibi	ility for module	/cou	rse						
_	Prof. Dr.Ir	Trinil Susilawa	ti,MS	, IPU, ASE	AN Eng.					
9.	Other infor	rmation (Refere	ences)						
	_									
	 Farm A 	nimal Reprodu	iction	(Hafez a	nd Hafez	, 2000)			
	 Fisiolo 	gi Reproduksi (Yekt	i dkk, 201	.8)					
	 Biologi 	Reproduksi (F	Rahay	ru dkk 202	20)					

ANIMAL GENETIC EVALUATION AND BREEDING PROGRAM DESIGN																		
Modul	e/Course	Student	Cre	dits	Semest	er	Frequency	7	Duration									
Code	-	workload	3 S(CU	1 st seme	ester	Each	1 semester										
PER80	002	228 hours					semester											
1.	Types of c	ourses		Contact	hours	Inde	pendent	Cl	ass size									
	Departmen	nt of Animal		48 hours	5	study	V	20)-25 students									
	Reproduct	ion and Breedi	ng			180 ł	iours											
	Compulsor	v Courses	0	8														
2.	Prerequisi	tes for participa	ation															
	-	tee for pur despe																
3	Learning	utcomes																
0.	200111180																	
	1 Able to explain the concept of inheritance of superior traits improvement of																	
	genetic quality and conservation of genetic notential of animal quantitative																	
	genetic models animal breading and nonulation genetics at the molecular level								ecular level									
	2 Able to analyze and evaluate genetic notential animal breeding value and							σ value and										
	2. nonula	tion genetic pro	nores	s due to s	election	inclui,		um	g value alla									
	3 Able to	develon self-le	arn i	nsight in e	waluatin	σ and s	solving probl	em	s in									
	implen	nenting animal	hree	ling nrog	ame in Ir	ndones	sia		5 111									
4	Subject ain	ns/content	bicct			luones	514											
т.	This course	a discusses abo	ut the	concent	faquetic	divor	sity the conc	ont	of inheritance									
	and reneti	tion of traits a	nd th	eir annlic	ations a	nimal	genetic qual	lity	improvement									
	nrograms	quantitative of	inu un	ic models	acions, a	timati	on of varia	nco	components									
	genetic ev	qualiticative g	de an	d models	genetic (rhango	s for several	tra	its increasing									
	selection	accuracy utiliz	as and	of hotor	osis and	l inhr	ading pres	u a	in brooding									
	programm	es application	ofsof	twore for	constic a	nalveie	molecular	Ton	etics in animal									
	brooding	es, application	tic di	uorcitu an	d nonula	tion of	s, motics at the	gem	olocular lovol									
5	Teaching n	nathods	tit ui	versity an	u popula	tion ge	inclus at the	, 1110										
5.	1 Speech																	
	2 Project	t Rase Learning																
	2. Troject	c Dasc Learning ase I earning																
	4 Group	Discussion																
6	Assessmer	nt methods																
0.	1 Individ	lual work																
	2 Goup y	vork																
	3 Mid an	d Final Term F	vam															
7	This modu	le/course is use	d in	the follow	ing study	v nrogi	ramme/s as y	wel	1									
/.	N/A		cu m		ing study	, prog	annie j 5 d5	WC1	1									
8	Responsib	ility for module	/com	rse														
0.	Prof.Dr.Ir.	Veronica Marga	reta	Ani Nurgi	artinings	ih.M.S	Sc.											
9.	Other info	rmation (Refere	ences)														
)														
	1. Allend	orf. F. W dan G.	H. Lu	ikart. 200	7. Conse	rvatio	n And The Ge	net	tics of									
	Popula	tions.																
	2. Blackw	vell Publishing	USA															
	3. Cintad	i. G. A. Budiarto	. Aula	ni'am. Y ()ktanella	. 2019	. Genetika da	n P	emuliaan :									
	Petern	akan- Veterine	, IIR	Press Mal	ang ISRI	V 978-	602-432-950)-1										
	4. Falcon	er. DS. Introduc	tion	to $Ouantit$	ative Ger	netics	1989. Longn	ian	Scientific &									
	Techni	cal. New York		- Laund														
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	PT Gra	media	. 0.0,		Pinasii	Cinuli		iun	ai Bapangan.									
	6. Widias	arana Indonesi	a. Iak	arta														
	S. mulus	a. and maonest	من بد	~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~					6. Widiasarana Indonesia. Jakarta.									

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Springer, Dordrecht, The Netherlands
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Mada University Press. Yogyakarta

ANIMAL BREEDING MANAGEMENT										
Module/Course		Student	Cre	dits	Semest	er	Frequency	requency Du		
		220 hours	3 30	JU	1 st semester		Each		1 semester	
PER8U		228 hours		Comboot	h	In da	semester	CI		
1.	Types of c	ourses		Contact	nours	Inde	pendent		20-25 students	
	Departmen	it of Animal		48 nours	5	stua	y	20		
	Reproduct	ion and Breedi	ng			180 1	iours			
2	Drerequisites for participation									
Ζ.	Prerequisites for participation									
3	- Learning outcomes									
5.	Learning 0	accomes								
	1 Able to	explain the ma	ating	system an	d selectio	n nro	gram to prod	luce	e male and	
	female	hreeds	i i i i i i i i i i i i i i i i i i i	system an	u sereetti	on pro	grain to prot	iuci		
	2. Able to	calculate the s	ucces	s of matir	σ					
	3. Able to	compile a data	i hase	and make	•e • data coi	rrectio	ons for evalua	atin	g animal	
	nerfori	mance as a basi	s for	animal sel	ection				8	
	4. Able to	calculate the n	eed f	or breeds	and anin	nal sur	oply			
	5. Able to	design and eva	aluate	e crossbre	eding pro	ogram	S			
4.	Subject ain	ns/content			01	- 0 -	-			
	This course	e discusses abo	ut the	e concept (of reprod	uction	and breedin	ig ir	n management	
	to produce	e animal breeds	s (fac	tors that a	affect ani	imal p	erformance,	unc	lerstanding of	
	genetic p	otential), the	mati	ng syste	m inclu	des t	he applicat	ion	of Artificial	
	Inseminati	on Techniques	(AI)	, embryo	transfer,	Assist	ted Reprodu	ctiv	ve Technology	
	(ATR), as	sessment of n	natin	g success	and it	s calc	ulations usi	ing	reproductive	
	parameter	s (NRR, S/C, CI	R, PR	, Calving	nterval,	calvin	g rate, calf c	rop	and weaning	
	rate), recording and correcting data, selection program on male/female through						male through			
	performance test and progeny test, calculation of population structure and animal									
	development patterns, calculation of the need for breeds and animal supply as well as									
	methods and evaluation of crossbreeding programs to produce breeds									
5.	Teaching methods									
	1. Speech	l								
	2. Project	t Base Learning								
	3. Case Ba	ase Learning								
	4. Group	Discussion								
6.	Assessmen	nt methods								
	1. Individ	lual work								
	2. Goup work									
	3. Mid an	d Final Term E	xam							
7.	This modu	le/course is use	ed in	the follow	ing study	y prog	ramme/s as v	wel	1	
	N/A									
8.	Responsib	ility for module	cou	rse		_	-			
	Prof.Dr.Ir.	Veronica Marga	areta	Ani Nurgi	artinings	ih , M.	Sc.			
9.	Other info	rmation (Refere	ences)						
	1. Ciptadi	i, G. A. Budiarto	, Aula	ini'am, Y ()ktanella	. 2019	. Genetika da	n		
	Pemuli	iaan : Peternaka	an-Ve	teriner. U	B Press. l	Malang	g. ISBN 978-6	502	-432-	
	950-1		1.			0				
	2. Journa	I of Animal Bre	eding	and Gene	tics. 202	U.				
	3. Hateza	and Hatez. 2000	J. Fari	m Animal	Keprodu	ction			DT	
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	Grame	ula widiasaran	a Ind	onesia. Jal	karta.		Carriel	J .		
	5. Nurgia	runingsin, V. M	. A. 20	JI/. Peng	antar Par	amete	er Genetik pa	aa		
	гегнак	. UD FIESS.								

	6.	Rahayu, dkk. 2020. Biologi Reproduksi.
	7.	Schultz, B. et al. 2020. Genetic improvement of livestock, from conventional
		breeding to biotechnological approaches in Animal Agriculture. Academic Press
	8.	Thiagarajan, R. 2014. Text book of Animal Breeding.
	9.	Van der Werf, J. H. J. 2019. Genetic Evaluation and Breeding Program
		Design. University of New England
	10	. Yekti, dkk. 2018. Fisiologi Reproduksi. UB Press.

Department of Livestock Reproduction and Breeding Elective Courses

ANIMA	L REPRODU	UCTIVE BIOTE	CHNC	DLOGY						
Modul	e/Course	Student	Cre	dits	Semest	ster Frequenc		y Duration		
Code	-	workload	kload 3 SCU 1 st semester		ester	Each		1 semester		
PER80004 228 hours							semester			
1.	Types of c	ourses		Contact	Contact hours Indep			Cl	Class size	
	Departmen	nt of Animal		48 hours	S	stud	у	20	20-25 students	
	Reproduct	ion and Breedir	ıg			180 ł	nours			
	Elective Co	ourse								
2.	Prerequisites for participation									
3.	Learning outcomes									
	 Able to at this Able to genetic Able to embry maniput Able to correct Able to 	o understand the time and in the o understand t c quality and pr o know and und o sexing techn ulation (cloning o apply the pri tly o prepare reseau	e anir futur he rc oduct ersta nique c), chi incipl rch in	nal repro- e ole of rep civity nd the bas s, embry meras, tra es of gan animal re	duction t roductive sic princi o transf ansgenic nete and eproduct	echnol e tech ples an er, in and en embr ion	logy that has nology in im nd applicatio vitro fertil nbryonic stea yo manipula	bee npro izat am tion	en developed oving animal of sperm and tion, embryo cells n techniques	
4.	Subject air	ns/content								
	This course discusses about Sexing technology and then embryo transfer which includes estrus synchronization, multiple ovulation/super ovulation, in vivo fertilization, in vitro fertilization, embryo manipulation, cloning, nuclear transfer and application of reproductive technology as well as analysis of the success and failure of each technology. In addition, students are required to participate in practice to achieve competence regarding gamete and embryo manipulation techniques and research in the field of animal reproduction,									
5.	Teaching methods									
	1. Speech									
	2. Project	t Base Learning								
	3. Case B	ase Learning								
	4. Group	Discussion								
6.	Assessment methods									
	1. Individual work									
	2. Group	WORK								
7	3. Mid an	a Final term Ex	am	h a f = 11 -	ding -1				1	
/.	I nis modu	ile/course is use	ea in f	the follow	ring study	y prog	ramme/s as	wel	.1	
0	N/A Dosponsih	ility for module	leave	60						
0.	Prof Dr Ir	Sri Wahauning	rtoui sib M	l SC Ici						
٥	Other info	rmation (Pofor)						
9.			nces	J						
	11. Buku A	Ajar Teknologi F	Repro	duksi (Sr	i Wahjun	ingsih	, dkk, 2019)			

12. Farm Animal Reproduction (Hafez and Hafez, 2000)

RUMIN	ANT AND N	ON-RUMINAN	T BR	EEDING						
Module	e/Course	Student	Cre	dits	Semester I		Frequency		Duration	
Code		workload	3 S(CU	1 st semester		Each		1 semester	
PER800	005	228 hours					semester			
1	Types of c	ourses		Contact	hours	Inde	nendent	CI	ass size	
1.	Dopartmor	ourses		10 hours	nouis	ctud		20.25 students		
	Departmen	ic of Allilla ion and Proodir	20	40 110013	5	100 k	y	20	-25 students	
	Election Co		Ig			1001	iours			
2	Elective Co	ourse								
Ζ.	Prerequisites for participation									
-	-									
3.	Learning o	utcomes								
	1. Able to	o explain the r	ecord	ling syste	m and b	reedir	ng patterns,	pro	cedures and	
	prepar	ation of breedi	ng pa	atterns for	r rumina	nts (b	eef cattle, da	airy	cattle, goats	
	and she	eep) and non-ru	umina	ant (poult	ry) to inc	rease	animal prod	ucti	vity	
	2. Able to	analyze and ev	valua	te animal	breeding	g polici	ies and the fo	orm	ation of new	
	breeds	in Indonesia ar	nd in	several de	eveloped	counti	ries			
	3. Able to	o develop self-	learn	ing meth	od in ev	aluatii	ng and solvi	ng	problems in	
	implen	nenting animal	breed	ling progr	ams in Ir	ndones	sia		-	
	1	0		01 0						
4	Subject ain	ns/content								
	Bubjeetuin	is, concent								
	This cou	rea discussas	aho	ut recor	dina sv	stom	methods r	roc	adures and	
	nnononati	an of broading	abu	ut fecul	unig sys	(hoof	methous, p	л UC	le goata and	
	preparation of the shareholder o	on of breeding	patte	noultwy) t		(beer	cattle, ually		le, goats and	
	sneep) ar	ia non-rumina	nts (poultry) (o increa	se ani	mai product		y as well as	
	animal br	eeding policies	and	the forma	tion of ne	ew bre	eas in Indon	lesia	a and several	
	developed	d countries								
5.	Teaching n	nethods								
	1. Speech	l								
	2. Project	: Base Learning								
	3. Case Ba	ase Learning								
	4. Group	Discussion								
6.	Assessmen	it methods								
	1. Individ	lual work								
	2. Group work									
	3. Mid an	d Final term Ex	am							
7.	This modu	le/course is use	ed in	the follow	ring study	y progi	ramme/s as	well	1	
	N/A	,			0.	10	,			
8.	, Responsibi	ility for module	/cou	rse						
	Prof. Dr.Ir.	Sucik Mavlinda	.MS							
9	Other infor	mation (Refere	nces)						
<i>.</i>	other moi	mation (nerere	mees)						
	1 Allond	orf E W dan C	цι	ilvart 200	7 Conce	ruation	a And The Ca	not	ice of	
	I. Anenua Dopulo	tions	п. Lu	ikai l. 200	7. Conse	ı vati0l	i Anu The Ge	inet	105 01	
		uuiis.								
	2. BIACKW	en rublisning.	USA	and and Mr.	1-4-4-1-11	2010	Constitution	P		
	3. Ciptadi	i, G. A. Budiarto	, Aula	ini am, Y (JKTANEIIA	. 2019.	. Genetika da	n P	emuliaan :	
	Peterna	акап- Veterinei	CUB	Press. Ma	lang. ISBI	N 978-	602-432-950	J-1		
	4. Hardjo	subroto, W. 199	94. Ap	olikasi Per	nuliabial	kan Te	rnak di Lapa	nga	n. PT	
	Grame	dia Widiasaran	a Ind	onesia. Jal	karta.					
	5. Maylin	<u>da, S. 2010. B</u> ul	<u>ku Pe</u>	ngantar P	<u>emuliaa</u> n	<u>Terna</u>	<u>ak. UB Pres</u> s.	Ma	lang	

6.	Nurgiartiningsih, V. M. A. 2017. Pengantar Parameter Genetik pada Ternak. UB									
	Press, Malang. ISBN:978-602-432-331-8									
7.	Schultz, B. et al. 2020. Genetic improvement of livestock, from conventional breeding to biotechnological approaches in Animal Agriculture. Academic Press									
8.	Thiagarajan, R. 2014. Text book of Animal Breeding.									
9.	Van der Werf, J. H. J. 2019. Genetic Evaluation and Breeding Program Design. University of New England									
ANIMAL	REPRODU	JCTIVE MOLEO	ULA	R GENET	ICS					
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Module/Course		Student	Cre	dits	Semester		r Frequency		Duration	
Code		workload	3 SC	CU	1 st seme	ester	ster Each		1 semester	
PER80006		228 hours					semester			
1.	Types of courses Department of Animal Reproduction and Breeding			Contact hours 48 hours		Independent study 180 hours		Class size 20-25 students		
2	Draraquisitas for participation									
2.	-									
3.	 Learning outcomes Able to understand the importance of reproduction in developing and increasing the efficiency of livestock business as well as genetic factors that influence the mechanism of reproduction Able to understand the mechanism of expression of reproductive traits in male and female animal in both genetic and non-genetic control Able to understand and carry out laboratory activities to analyze polymorphism, genomic, proteomic on reproductive characteristics of male livestock (spermatogenesis and semen production) and female animal (folliculogenesis, embryonic development, pregnancy, reproductive disorders), nutrigenomic analysis in reproduction and its role in animal development Able to identify other factors related to genetics on reproductive performance in male and female animal (physiological factors, the influence of environmental stress, nutrition) Able to identify genetic aspects in the field of reproduction and develop them in research ideas in order to complete the final project and answer field problems in a multidisciplinary manner Able to increase the level of scientific and laboratory skills for the analysis of reproductive genetics and other traits in the field of animal science in accordance with the development of science and technology 									
4. 5.	 Subject aims/content This course discusses about three main aspects in reproductive molecular genetics, namely: (1) the mechanism of expression of reproductive traits (starting from the performance of DNA, RNA, RNA transcription for reproductive traits, non-genetic factors that affect reproductive traits), (2) the main aspects in regulating the expression of reproductive traits in male cattle (spermatogenesis processes, semen production; folliculogenesis, genetics in pregnancy and embryonic growth, reproductive disorders, nutrigenomics and reproduction); and (3) molecular analysis for reproductive traits using ELECTROPHORESIS PCR, RFLP, SNP, GENOMIC TECHNIQUES and RNA SEQUENCING, Teaching methods Speech Project Base Learning Case Base Learning 									
	 Speech Project Case Ba Group 	nethods : Base Learning ase Learning Discussion								

	2. Group work					
	3. Mid and Final term Exam					
7.	This module/course is used in the following study programme/s as well					
	N/A					
8.	Responsibility for module/course					
	Prof. Dr. Sc.Agr. Ir. Suyadi, MS, IPU, ASEAN Eng					
9.	Other information (References)					
	1. Jiang, Zhiau and Troi L. Ott. 2010. Reproductive Genomics in Domectic Animals.					
	Willey-Blacwell. Ames, IOWA, USA.					
	2. Fatchiyah, Laras E., S Widiyarti, S Rahayu. 2011. Biologi Molekular: Prinsip Dasar					
	Analisis. Penerbit Erlangga. Jakarta					
	3. Yuwono, T. 2005. Biologi Molekular. Penerbit Erlangga. Jakarta					