		AS/AAS						
		CERT B: Agronomy						
		CERT B: Agribusiness Specialist: Livestock (CERTA + 15 hrs. electives)						
		CERT A: Agribusiness						
Agriculture		*Course to Program Map*						
Program Outcomes: Upon completion of the program, graduates will be able to…	Institutional Skills	analyze the current events and issues that are occurring in agriculture.	examine the relationships between inputs and outputs in their agricultural field to make effective and profitable decisions.	explore aspects of agriculture used by scientists, marketers and producers.	apply existing and emerging knowledge and technologies.	apply management and marketing skills.	compare marketing and husbandry of several different animal species.	explain crop production concepts, range management and soil management.
Courses								
AGEC 100 Agriculture Economics	CPW	IRM	IRM	IRM	IR	IR	IR	IRM
AGEC 102 Farm Management & Accounting	P	IRM	IRM	IRM	IR	IRM	IRM	IRM
AGEC 103 Ag Marketing & Futures	CPW	IRM	RM	RM	I	RM	IR	I
AGEC 106 Ag & Food Business Management	CP	RM	RM	R	I	IRM	I	I
AGRI 100 Agriculture in our Society	C	IRM	IR	RM	I	I	R	R
AGRI 120, 121, 122 Agriculture Internship	CPW	IR	IR	IRM	RM	I	I	I
AGRO 102 Range Management	PW	IRM	IR	IR	I	I	IRM	IRM
ANSI 101 Animal Diseases & Health	CPW	IRM	I	IRM	IR	IR	IRM	
ANSI 102 Principles of Animal Science	CPW	I	I	I	I	IR	IRM	
ANSI 103 Animal Science & Industry Lab	CP	IRM	I	IRM	IRM	IRM	IRM	
ANSI 104 Commercial Feedlot Operations	CPW	IRM	IRM	I	RM	I	I	
ANSI 105 Cow-Calf Operations	CPW	IRM	IR	IRM	RM	IR	RM	
ANSI 106 Dairy & Poultry Production	CW	IRM	IRM	IRM	R	IRM	I	
ANSI 107 Animal Nutrition	CP	IR	I	I	IRM	IR	IR	
ANSI 108 Livestock Selection	CPW	IR	IRM	IR	IRM	IRM	RM	

Mapping	
I	Introduced
R	Reinforced
M	Mastered
A	Assessed/Artifact

Essential Skills	
1	written communication
2	oral communication
3	critical thinking
4	cultural diversity
5	social responsibility

Employability Skills	
C	communication
P	problem solving
W	work ethic

Course	Type	1	2	3	4	5	6	7
ANSI 109 Livestock Evaluation	CPW	IR	IR	IRM	IR	IRM	IRM	
ANSI 110 Swine Production	CP	IR	IRM	IRM	R	I	I	
ANSI 111 Farm Animal Reproduction	CPW	IR	IR	IR	IRM	I	RM	
ANSI 1110 Farm Animal Reproduction Lab	CPW	I	I	I	R	I	I	
ANSI 120 Special Topics in Livestock Management	CP	I	I	IRM	IRM	RM	IRM	
ANSI 129 Meat & Carcass Evaluation	CPW	RI	IR	I	IR	RM	R	
ANSI 130 Classification, Grading & Selection of Meats	CPW	IR	IR	IR	R	R	IRM	
ANSI 131 Introduction to Food Science	CPW	I	I	IRM	I	IRM	R	
ANSI 135 SERVSAFE	CP	I	I	IRM	I	IRM	IRM	
ANSI 140 Horse Science	CP	IR	IRM	IRM	IRM	I	I	
ANSI 141 Horsemanship	PW	R	IRM	I	R	IRM	I	
ANSI 206 Principles of Meat Evaluation	CPW	IR	IR	IR	R	IRM	IRM	
ANSI 207 Principles of Meat Science	CP	IR	IR	IR	IRM	IRM	IRM	
ANSI 213 Animal Handling & Welfare	CP	IR	IR	IRM	IR	IRM	IRM	
ANSI 215 Introduction to Food Law	CP	IR	IR	IRM	R	R	R	
ANSI 216 Principles of Meat Processing & Fabrication	CPW	I	IRM	I	IRM	RM	R	
ANSI 217 Principles of Artificial Inseminations	CP	IR	IR	I	RM	IRM	IRM	
ANSI 250 Animal Genetics	CP	IR	IR	IRM	RM	R	IRM	
WELD 110 Introduction to AWS Welding	CP	I	IRM	I	I	I	I	
AGRO 101 Crops & Crops Lab	CPW	R	IRM	IRM	IRM	IRM		IRM
AGRO 103 Soils & Soils Lab	CPW	R	IR	RM	IRM	IRM		IRM
AGRO 120 Special Topics in Crops Management	CP	RM	IRM	I	R	I		IRM

	AS/AAS						
	CERT B: Agronomy						
	CERT B: Agribusiness Specialist: Livestock (CERTA + 15 hrs. electives)						
	CERT A: Agribusiness						
AGEC 100 Agriculture Economics	*Curriculum Mapping*						
Course SLO: Students will be able to / **Program Outcomes**	analyze the current events and issues that are occurring in agriculture.	examine the relationships between inputs and outputs in their agricultural field to make effective and profitable decisions.	explore aspects of agriculture used by scientists, marketers and producers.	apply existing and emerging knowledge and technologies.	apply management and marketing skills.	compare marketing and husbandry of several different animal species.	explain crop production concepts, range management and soil management.
define agricultural economics.	IRM	I	IRM	IR	IR	IR	IR
describe market price determination.	IRM	IRM	IRM	IR	IR	IR	IR
recognize financial markets.	IR	IRM	IR	IR	IR	IR	IRM
identify money and financial intermediaries.	IRM	IR	IR	IR	IR	IR	IR
define monetary policy.	R	IR	IR	IR	IRM	IR	IR
distinguish the circular flow of income.	R	IR	IR	IR	IR	IR	IR
research agricultural policy.	R	IRM	IR	IR	IR	IR	IRM
recognize the firm as a production unit.	IRM	IRM	IRM	IR	IR	IR	IR
examine costs and optimal output levels.	R	IRM	IRM	IR	IR	IR	IRM
discover career and development skills.	R	R	I	R	R	R	I

AS/AAS							
CERT B: Agronomy							
CERT B: Agribusiness Specialist: Livestock (CERTA + 15 hrs. electives)							
CERT A: Agribusiness							

AGEC 102 Farm Management & Accounting

Curriculum Mapping

Course SLO: Students will be able to	Program Outcomes	analyze the current events and issues that are occurring in agriculture.	examine the relationships between inputs and outputs in their agricultural field to make effective and profitable decisions.	explore aspects of agriculture used by scientists, marketers and producers.	apply existing and emerging knowledge and technologies.	apply management and marketing skills.	compare marketing and husbandry of several different animal species.	explain crop production concepts, range management and soil management.
describe competencies in management.		IR	IRM	IR	IR	I	IR	IR
calculate depreciation.		IR	IRM	IRM	IR	I	IRM	IR
calculate balance sheet and income statement.		IRM	IRM	IRM	IR	I	IRM	IRM
examine forms of budgeting.		IR	IRM	IRM	IR	I	IR	IR
tabulate performance and organization.		IRM	IRM	IRM	IR	I	IR	IR
examine capital and the use of credit.		IR	IRM	IR	IR	I	IR	IR
administer human resource management.		IRM	IRM	IRM	IR	I	IRM	IR
examine machinery management.		R	R	R	R	I	I	I

AGEC 103 Ag Marketing & Futures	AS/AAS						
	CERT B: Agronomy						
	CERT B: Agribusiness Specialist: Livestock (CERTA + 15 hrs. electives)						
	CERT A: Agribusiness						
	Curriculum Mapping						
Program Outcomes	analyze the current events and issues that are occurring in agriculture.	examine the relationships between inputs and outputs in their agricultural field to make effective and profitable decisions.	explore aspects of agriculture used by scientists, marketers and producers.	apply existing and emerging knowledge and technologies.	apply management and marketing skills.	compare marketing and husbandry of several different animal species.	explain crop production concepts, range management and soil management.
Course SLO: Students will be able to							
describe the market.	IRM	R	R	I	RM	I	I
observe futures and options mechanics.	R	R	R	I	RM	R	I
recognize fundamental and technical analysis.	IRM	R	R	I	RM	I	I
discover psychology of the markets.	RIM	R	R	I	R	R	I
distinguish price risk management strategies.	RIM	R	R	I	R	I	I
discover career development skills.	R	R	R	I	R	I	I

AGEC 106 Ag & Food Business Management	AS/AAS						
	CERT B: Agronomy						
	CERT B: Agribusiness Specialist: Livestock (CERTA + 15 hrs. electives)						
	CERT A: Agribusiness						
	Curriculum Mapping						
Program Outcomes	analyze the current events and issues that are occurring in agriculture.	examine the relationships between inputs and outputs in their agricultural field to make effective and profitable decisions.	explore aspects of agriculture used by scientists, marketers and producers.	apply existing and emerging knowledge and technologies.	apply management and marketing skills.	compare marketing and husbandry of several different animal species.	explain crop production concepts, range management and soil management.
Course SLO: Students will be able to							
complete an entire business plan start to finish.	RM	RM	R	I	IRM	I	I
organize supplies and facilities.	R	RM	R	I	IRM	I	I
formulate production, labor and supply.	RM	R	R	I	IRM	I	I
facilitate price and acquiring finances.	RM	RM	R	I	IRM	I	I

AS/AAS						
CERT B: Agronomy						
CERT B: Agribusiness Specialist: Livestock (CERTA + 15 hrs. electives)						
CERT A: Agribusiness						

AGRI 100 Agriculture in our Society

Curriculum Mapping

Course SLO: Students will be able to	analyze the current events and issues that are occurring in agriculture.	examine the relationships between inputs and outputs in their agricultural field to make effective and profitable decisions.	explore aspects of agriculture used by scientists, marketers and producers.	apply existing and emerging knowledge and technologies.	apply management and marketing skills.	compare marketing and husbandry of several different animal species.	explain crop production concepts, range management and soil management.
discover college planning.	IR	I	RM	I	I	R	R
observe industry challenges and opportunities.	IRM	I	RM	I	I	R	R
prepare career orientation research and exploration.	IRM	I	RM	I	I	R	R
structure career development skills.	R	R	RM	I	I	R	R

Program Outcomes

AGRI 120, 121, 122 Agriculture Intern	AS/AAS						
	CERT B: Agronomy						
	CERT B: Agribusiness Specialist: Livestock (CERTA + 15 hrs. electives)						
	CERT A: Agribusiness						
	Curriculum Mapping						
Program Outcomes	analyze the current events and issues that are occurring in agriculture.	examine the relationships between inputs and outputs in their agricultural field to make effective and profitable decisions.	explore aspects of agriculture used by scientists, marketers and producers.	apply existing and emerging knowledge and technologies.	apply management and marketing skills.	compare marketing and husbandry of several different animal species.	explain crop production concepts, range management and soil management.
Course SLO: Students will be able to							
develop personal skills	I	I	IRM	RM	I	I	I
discover interpersonal skills	I	I	IRM	RM	I	I	I
describe thinking and problem solving skills	I	I	IRM	RM	I	I	I
demonstrate communication skills	R	I	IRM	RM	I	I	I
recognize technology literacy	I	I	IRM	RM	I	I	I
collect career development skills	I	R	IRM	RM	I	I	I

AGRO 102 Range Management	Program Outcomes	AS/AAS						
		CERT B: Agronomy						
		CERT B: Agribusiness Specialist: Livestock (CERTA + 15 hrs. electives)						
		CERT A: Agribusiness						
		Curriculum Mapping						
		analyze the current events and issues that are occurring in agriculture.	examine the relationships between inputs and outputs in their agricultural field to make effective and profitable decisions.	explore aspects of agriculture used by scientists, marketers and producers.	apply existing and emerging knowledge and technologies.	apply management and marketing skills.	compare marketing and husbandry of several different animal species.	explain crop production concepts, range management and soil management.
Course SLO: Students will be able to								
discover range understanding and managements.		RM	R	I	I	I		IRM
examine description of rangeland types.		IRM	I	I	I	I		I
describe range plant physiology.		I	I	I	I	I		I
examine range ecology.		I	I	I	I	I		I
explain range inventory and monitoring.		I	I	I	I	I		I
compose stocking rates.		IRM	I	I	I	I		I
survey selection of grazing methods.		I	I	I	I	I		IRM
determine range wildlife management.		I	I	I	I	I		I
establish career development skills.		R	R	R	I	I		I

ANSI 101 Animal Diseases & Health	AS/AAS							
	CERT B: Agronomy							
	CERT B: Agribusiness Specialist: Livestock (CERTA + 15 hrs. electives)							
	CERT A: Agribusiness							
	Curriculum Mapping							
Program Outcomes	analyze the current events and issues that are occurring in agriculture.	examine the relationships between inputs and outputs in their agricultural field to make effective and profitable decisions.	explore aspects of agriculture used by scientists, marketers and producers.	apply existing and emerging knowledge and technologies.	apply management and marketing skills.	compare marketing and husbandry of several different animal species.	explain crop production concepts, range management and soil management.
Course SLO: Students will be able to							
define the term disease and list the most common diseases.	IRM	I	I	IR	IR	I	
list and describe conditions that are non-infections diseases.	IRM	I	I	IR	IR	I	
define the term infectious disease and describe symptoms.	IRM	I	I	IR	IR	I	
analyze the body's reaction to infections.	IR	I	I	IR	IR	I	
summarize the relationship between the host and the invading organism.	IR	I	I	RI	IR	I	
examine the characteristics of microorganisms that cause disease.	IR	I	I	IR	IR	I	
discuss factors involved in disease prevention.	IR	I	I	IR	IR	IRM	
appraise the role of nutrition in fighting disease.	IR	I	I	IR	IR	IRM	
list and describe the function in disease resistance of the six classes of nutrients.	IR	I	I	IR	IR	I	

explain the function of sanitation for disease control and how water/feeds are vital in being sanitized or pathogen free.	I	I	I	IR	IR	I	
describe the effects of manure storage, water pollution, pasture rotation and disposal of carcasses on disease prevention.	I	I	I	IR	IR	I	
analyze the role of disinfectants in preventing disease.	I	I	I	IR	IR	I	
discuss biological agents and immunizing agents used in animal health.	I	I	I	IR	IR	I	
create a vaccination program to decrease the occurrence of disease.	I	I	I	IR	IR	I	
explain principles associated with legal quarantine and type of facilities.	I	I	I	IR	IR	I	
relate the importance of animal housing, pens, bedding, and space on health.	I	I	I	IR	IR	I	
examine the importance of hereditary factors and abnormalities on health.	I	I	I	IR	IR	I	
describe basic husbandry practices to decrease disease.	I	I	I	IR	IR	I	
discuss methods of administering vaccinations and medications.	I	I	I	IR	IR	I	
describe principles of management during parturition.	I	I	I	IR	IR	I	
summarize methods used to treat sick cattle, sheep, swine and horses.	IRM	I	IRM	IR	IR	I	
list and discuss diseases associated with the digestive system.	I	I	I	IR	IR	I	
list and discuss diseases associated with the genitourinary system.	I	I	I	IR	IR	I	
list and discuss diseases associated with the respiratory system.	I	I	I	IR	IR	I	

list and discuss diseases associated with the circulatory system.	I	I	I	IR	IR	I	
list and discuss diseases associated with the nervous system.	I	I	I	IR	IR	I	
list and discuss generalized diseases.	I	I	I	IR	IR	I	
describe metabolic and deficiency diseases	I	I	I	IR	IR	I	
explain diseases that are localized and affect the skin and extremities.	I	I	I	IR	IR	I	
analyze the effects of plant and chemical poisonings.	I	I	I	IR	IR	I	
summarize the role of parasitology in animal health.	I	I	I	IR	IR	I	
create a control and prevention method for parasites.	I	I	I	IR	IR	I	

	AS/AAS						
	CERT B: Agronomy						
	CERT B: Agribusiness Specialist: Livestock (CERTA + 15 hrs. electives)						
	CERT A: Agribusiness						
ANSI 102 Principles of Animal Science	*Curriculum Mapping*						
Program Outcomes → / Course SLO: Students will be able to	analyze the current events and issues that are occurring in agriculture.	examine the relationships between inputs and outputs in their agricultural field to make effective and profitable decisions.	explore aspects of agriculture used by scientists, marketers and producers.	apply existing and emerging knowledge and technologies.	apply management and marketing skills.	compare marketing and husbandry of several different animal species.	explain crop production concepts, range management and soil management.
identify contributions that domesticated animals have made to civilization.	I	I	I	I	IR	IRM	I
describe the differences in structure and function between monogastric and polygastric farm animals.	I	I	I	I	IR	I	I
identify the sources, functions and utilization of each of the classes of nutrients.	I	I	I	I	IR	IRM	I
identify and describe the function of each part of the male and female reproductive system.	I	I	I	I	IR	I	I
describe the sequence of events in the estrous cycle, the fertilization of the female egg and the implantation of the fertilized embryo.	I	I	I	I	IR	I	I
describe the appropriate husbandry practices which enhance reproductive efficiency.	I	I	I	I	IR	I	I

describe how heritability influences production traits.	I	I	I	I	IR	IRM	I
describe the parts and functions of a terminal market.	I	I	I	I	IR	I	I
compare the various methods of marketing livestock.	I	I	I	I	IR	I	I
describe the characteristics of wool and the methods of grading wool.	I	I	I	I	IR	IRM	I
identify important characteristics of the major breeds of livestock.	I	I	I	I	IR	I	I
compare economically traits ways of measuring productivity in farm animals.	I	I	I	I	IR	IRM	I
compare economically important factors for the product of cattle, sheep and pigs.	I	I	I	I	IR	IRM	I
compare the differences between animals with normal and abnormal health.	I	I	I	I	IR	I	I
identify methods for creating immunity in livestock.	I	I	I	I	IR	I	I
evaluate differences between and amongst slaughter animals and methods of slaughter for each species.	I	I	I	I	IR	I	I
identify different livestock grades and market classes.	I	I	I	I	IR	I	I
describe processing procedures of meat animal carcasses.	I	I	I	I	IR	IRM	I
compare production factors for different species of livestock.	I	I	I	I	IR	I	I
describe factors involved in meat consumption, sales and consumer acceptability.	I	I	I	I	IR	IRM	I

ANSI 103 Animal Science & Industry Lab								
		AS/AAS						
		CERT B: Agronomy						
		CERT B: Agribusiness Specialist: Livestock (CERTA + 15 hrs. electives)						
		CERT A: Agribusiness						
		Curriculum Mapping						
	Program Outcomes	analyze the current events and issues that are occurring in agriculture.	examine the relationships between inputs and outputs in their agricultural field to make effective and profitable decisions.	explore aspects of agriculture used by scientists, marketers and producers.	apply existing and emerging knowledge and technologies.	apply management and marketing skills.	compare marketing and husbandry of several different animal species.	explain crop production concepts, range management and soil management.
Course SLO: Students will be able to								
recognize the impact of the feedlot industry on the southwest Kansas economy.		IRM	I	IR	I	IR	IR	
realize the opportunities for careers in the animal feeding industry.		IRM	I	IR	I	IR	IR	
extrapolate the importance of technology in cattle feeding.		IRM	I	IR	IRM	IR	IR	
relate the importance of marketing systems in cattle, sheep and pig feeding and slaughter.		IRM	I	IRM	I	IRM	IRM	
recognize the importance of the harvest industry for southwest Kansas.		IRM	I	IR	I	IRM	IRM	
relay the importance of new technology in beef, pork and lamb harvest.		IRM	I	IR	IRM	IRM	IRM	
describe and calculate the factors that determine the value of a carcass.		IR	I	IRM	IRM	IR	IRM	
identify the parts of a polygastric (ruminant) digestive system and explain the functions of each part.		I	I	IRM	I	IR	IRM	

identify the parts of a female bovine/porcine reproductive system and explain the functions of each part.	RI	I	IR	I	IR	IR	
explain the relationship between alcohol production, cattle feeding, farming and fish production in southwest Kansas.	IRM	I	IRM	IRM	IRM	IR	
explain the difference in economics and consumer value between various grades of whole muscle meat and ground beef available in supermarkets.	IR	I	IR	I	IRM	IR	
understand the role of the commercial cow producer in southwest Kansas.	IR	I	IR	I	IRM	IRM	
understand the role of commercial sheep and swine production in southwest Kansas.	IR	I	IR	I	IRM	IR	
relate the importance of tenderness, flavor, aroma and juiciness and how it relates to the sensory characteristics of meat.	IR	I	IR	I	IR	IR	
evaluate and predict USDA Quality and Yield Grades for livestock that are to be harvested.	I	I	IR	IRM	IR	IRM	

	AS/AAS						
	CERT B: Agronomy						
	CERT B: Agribusiness Specialist: Livestock (CERTA + 15 hrs. electives)						
	CERT A: Agribusiness						
ANSI 104 Commercial Feedlot Operations	*Curriculum Mapping*						
Program Outcomes	analyze the current events and issues that are occurring in agriculture.	examine the relationships between inputs and outputs in their agricultural field to make effective and profitable decisions.	explore aspects of agriculture used by scientists, marketers and producers.	apply existing and emerging knowledge and technologies.	apply management and marketing skills.	compare marketing and husbandry of several different animal species.	explain crop production concepts, range management and soil management.
Course SLO: Students will be able to							
explain the purpose, business aspects, trends, and history of commercial cattle feeding.	IRM	IR	I	R	I	I	
discuss the role of the railroads, markets, cattle drives and new practices in the history of cattle feeding.	I	IR	I	R	I	I	
discuss the role of management and programs for successful programs including economic packages, safety and procurement.	I	IRM	I	RM	I	I	
describe and extrapolate on the various practices in the feedlot industry: feeding schedules, profiting schedules, milling, feed delivery, marketing, processing, handling and procurement.	IRM	IR	I	R	I	I	
explain the practices of pen size adjustments, first feeding, inspection, weighing, and inventory control.	I	IRM	I	R	I	I	

contrast and compare the uses of feedlot equipment and technology.	I	IR	I	R	I	I	
describe and relate the importance of environmental problems and solutions in the feedlot industry.	IRM	IRM	I	R	I	I	
examine the importance of nutrition and energy feeds and their cost efficiency.	I	IR	I	R	I	I	
discuss the feed-mill operations and the use of feed additives and their regulatory agency.	I	IR	I	R	I	I	
discuss popular and unpopular trends in the feedlot industry.	IRM	IR	I	R	I	I	

	AS/AAS						
	CERT B: Agronomy						
	CERT B: Agribusiness Specialist: Livestock (CERTA + 15 hrs. electives)						
	CERT A: Agribusiness						

ANSI 105 Beef Production	Curriculum Mapping						
Program Outcomes	analyze the current events and issues that are occurring in agriculture.	examine the relationships between inputs and outputs in their agricultural field to make effective and profitable decisions.	explore aspects of agriculture used by scientists, marketers and producers.	apply existing and emerging knowledge and technologies.	apply management and marketing skills.	compare marketing and husbandry of several different animal species.	explain crop production concepts, range management and soil management.
Course SLO: Students will be able to							
explain the purpose, business aspects and trends in Beef Production.	IRM	IR	IRM	R	IRM	IRM	
discuss the role of computers in Beef herds.	IRM	IR	I	RM	I	RM	
describe the characteristics in selecting breeding stock and appraise these qualities on cows, bulls and heifers.	IR	IR	IRM	R	I	R	
analyze the role of genetics in EPD's and efficiency of stock.	IR	IR	IRM	RM	I	R	
explain heterotic and differentiate between the different breeding systems that are used in beef production.	IR	IR	I	R	I	R	
give examples of different factors in reproductive performance.	IR	IR	IRM	R	I	R	
discriminate between biological and economic efficiency.	IR	IR	IRM	R	I	R	
explain and examine the purebred breeding program.	IRM	IR	I	R	I	R	

Objective							
compare the financial aspects of various methods of raising purebred cattle and calculate depreciation, operating costs and receipts.	IR	IR	IRM	R	I	R	
describe the different methods for improving beef breeding, including AI and ET.	IR	IR	IRM	R	I	R	
contrast the different types of sales, advertising and presentation techniques for merchandizing beef cattle.	IR	IR	I	RM	IRM	R	
examine the concepts of pregnancy, parturition and care of the calf.	IR	IR	I	R	I	R	
diagram different types of fetal membranes, the placenta, umbilical cord and the uterus.	IR	IR	I	R	I	R	
list and describe different signs of pregnancy.	IR	IR	IRM	R	I	R	
outline and predict embryonal mortality and detect signs of parturition and labor in cows.	IR	IR	I	R	I	R	
list and describe the care of the newborn calf.	IR	IR	I	R	I	R	
examine the principles of beef cattle feeding citing the significance of the feature of the ruminant digestive system.	IR	IR	IR	R	I	R	
summarize the nutrient requirements of the cow, bull and calf.	IR	IR	IR	R	I	R	
list and define the terms associated with feeding requirements.	IR	IR	I	R	I	IRM	
analyze the importance of forage quality for breeding cattle.	IR	IR	I	R	I	R	
list the reasons for feeding and how to choose the correct supplement.	IR	IR	I	R	I	R	

discuss the role of using non-protein nitrogen sources	IR	IR	I	R	I	R	
explain and formulate a creep feeding ration for calves.	IR	IR	I	R	I	R	
describe how to improve low quality forages.	IR	IR	I	R	I	R	
summarize the aspects of raising replacement heifers, including growth, factors affecting puberty and age at calving.	IR	IR	I	R	I	R	
discuss rebreeding of the herd cows and heifers.	IR	IR	I	R	I	R	
explain about proper conditioning of livestock prior, during and after breeding season.	IR	IR	I	R	I	R	
discuss management practices of nursing calves: dehorning, vaccination, weaning, implanting and identification.	IR	IR	I	RM	I	R	

ANSI 106 Dairy & Poultry Production							

		AS/AAS					
		CERT B: Agronomy					
		CERT B: Agribusiness Specialist: Livestock (CERTA + 15 hrs. electives)					
		CERT A: Agribusiness					

Curriculum Mapping

Course SLO: Students will be able to	Program Outcomes	analyze the current events and issues that are occurring in agriculture.	examine the relationships between inputs and outputs in their agricultural field to make effective and profitable decisions.	explore aspects of agriculture used by scientists, marketers and producers.	apply existing and emerging knowledge and technologies.	apply management and marketing skills.	compare marketing and husbandry of several different animal species.	explain crop production concepts, range management and soil management.
become familiar with the history, current state and impact of the dairy industry.		IRM	IR	R	R	I	I	
identify the breeds of dairy utilized in today's industry.		I	I	R	R	I	I	
understand factors to consider in establishing and maintaining dairy herds.		I	I	R	R	I	I	
determine factors necessary for a successful dairy breeding operation.		IRM	I	I	R	I	I	
relate the importance of understanding dairy cattle nutrition to the effect on profitable production.		I	I	I	R	I	I	
understand dairy cattle behavior and why it is important and how this information can be utilized.		I	IR	R	R	I	I	
understand the importance of good records in order to have a successful operation.		R	I	IRM	R	IRM	I	
identify common health problems and what managerial efforts can be done to prevent or treat these ailments.		I	I	I	R	I	I	

appraise dairy cattle facility requirements and develop a mock facility that will be conducive to a successful operation while meeting governmental requirements.	R	I	I	R	I	I	
address the impact of the poultry industry.	RM	I	R	R	I	I	
develop an understanding of the biology of poultry.	R	I	I	R	I	I	
identify factors associated with successful incubation.	R	IRM	IRM	R	I	I	
apply knowledge of poultry genetics with appropriate breeding systems.	I	I	I	R	I	I	
develop knowledge associated with proper poultry nutrition.	I	I	I	R	I	I	
analyze various aspects related to proper poultry management.	IRM	I	I	R	IRM	I	
understand issues related to poultry waste and impact on the environment.	I	I	I	R	I	I	
address factors related to successful management of the flock in relation to behavior, stress and welfare.	I	I	I	R	I	I	
identify common health problems and what can be done to prevent or treat these ailments.	I	IR	I	R	I	I	
appraise poultry facility requirements and develop a mock facility that will be successful while meeting all governmental requirements.	I	I	I	R	I	I	

	AS/AAS						
	CERT B: Agronomy						
	CERT B: Agribusiness Specialist: Livestock (CERTA + 15 hrs. electives)						
	CERT A: Agribusiness						
ANSI 107 Animal Nutrition	*Curriculum Mapping*						
Program Outcomes	analyze the current events and issues that are occurring in agriculture.	examine the relationships between inputs and outputs in their agricultural field to make effective and profitable decisions.	explore aspects of agriculture used by scientists, marketers and producers.	apply existing and emerging knowledge and technologies.	apply management and marketing skills.	compare marketing and husbandry of several different animal species.	explain crop production concepts, range management and soil management.
Course SLO: Students will be able to							
list and describe the six classes of nutrients and what is required for normal body processes.	R	I	I	R	I	I	
describe the parts and functions of the ruminant and non-ruminant digestive system while listing absorption sites for certain nutrients.	R	I	I	R	I	I	
determine and analyze a feed source by using laboratory techniques to determine composition of a feed using proximate analysis.	I	I	I	IRM	I	I	
list and discuss the classification of feedstuffs.	R	I	I	R	I	IRM	
define the role of energy feed sources and list feeds high in energy.	R	I	I	IRM	I	I	
describe feeds that are concentrate feeds and contest them with energy feed sources.	R	I	I	R	I	I	
summarize the role of proteins in feeds and list sources, animal requirements and un-conventional sources of proteins.	I	I	I	R	I	I	

determine the role of synthetic amino acids and non-proteins nitrogen sources.	I	I	I	R	I	I	
discuss the role of roughages and define what is a roughage.	R	I	I	R	I	I	
discuss the role of micro-nutrients (vitamins and minerals) and the requirements for livestock species.	I	I	I	R	I	I	
extrapolate the use of feed additives in a ration as well as flavorings, growth promotants, drugs and digestion modifiers in a ration.	I	I	I	IRM	I	I	
discuss the importance and uses for water in the ration and in the animal body.	R	I	I	R	I	I	
discuss formulation, manufacturing and processing of feed in a ration.	I	I	I	IRM	R	IR	
compare, contrast and list the nutrient requirements for swine, avian, beef cattle, sheep, goats, dairy cattle and horses.	I	I	I	R	I	I	

	AS/AAS						
	CERT B: Agronomy						
	CERT B: Agribusiness Specialist: Livestock (CERTA + 15 hrs. electives)						
	CERT A: Agribusiness						

Curriculum Mapping

Course SLO: Students will be able to	analyze the current events and issues that are occurring in agriculture.	examine the relationships between inputs and outputs in their agricultural field to make effective and profitable decisions.	explore aspects of agriculture used by scientists, marketers and producers.	apply existing and emerging knowledge and technologies.	apply management and marketing skills.	compare marketing and husbandry of several different animal species.	explain crop production concepts, range management and soil management.
evaluate the differences in fat thickness, muscling and weight in live market animals.	IR	IRM	IR	I	I	R	
estimate dressing percentage and USDA Quality/Yield Grades for market animals.	IR	I	I	IRM	I	R	
evaluate classes for details and select animals that should be culled from the group.	IR	IRM	IR	I	I	R	
analyze the difference in dressing percentage by species and determine what effects the changes.	IR	I	I	I	I	R	
rank a market class of livestock.	IR	I	I	IRM	I	RM	
determine whether to keep or cull a breeding animal for reproductive soundness or structure OR by using EPD's of what is expected from breeding.	IR	I	IR	IRM	I	R	
calculate carcass value on swine, lamb and beef carcasses.	IR	IRM	I	I	IRM	RM	
estimate quality and yield grade for beef and lamb carcasses.	IR	I	IR	IRM	I	RM	

determine percent yield on wholesale cuts of beef, pork and lamb.	IR	I	I	IRM	IRM	RM	
rank breeding bulls, cows and replacement heifers on structure, soundness and EPD's according to production data.	IR	I	I	I	I	R	
examine the properties that affect growth, composition and maturity on pigs, cattle and lambs.	IR	I	I	I	I	RM	

AS/AAS							
CERT B: Agronomy							
CERT B: Agribusiness Specialist: Livestock (CERTA + 15 hrs. electives)							
CERT A: Agribusiness							

ANSI 109 Livestock Evaluation	Curriculum Mapping						
Program Outcomes	analyze the current events and issues that are occurring in agriculture.	examine the relationships between inputs and outputs in their agricultural field to make effective and profitable decisions.	explore aspects of agriculture used by scientists, marketers and producers.	apply existing and emerging knowledge and technologies.	apply management and marketing skills.	compare marketing and husbandry of several different animal species.	explain crop production concepts, range management and soil management.
Course SLO: Students will be able to							
evaluate the differences in fat thickness, muscling and weight in live market animals.	IR	IR	I	I	I	R	
estimate dressing percentage and USDA Quality/Yield Grades for market animals.	IR	I	I	I	I	R	
evaluate classes for details and select animals that should be culled from the group.	IR	I	I	I	I	R	
analyze the difference in dressing percentage by species and determine what effects the changes.	IR	I	I	I	I	R	
rank a market class of livestock.	IR	I	IRM	I	IRM	IRM	
determine whether to keep or cull a breeding animal for reproductive soundness or structure OR by using EPD's of what is expected from breeding.	IR	I	I	IR	I	R	
calculate carcass value on swine, lamb and beef carcasses.	IR	I	IRM	I	I	IRM	

estimate quality and yield grade for beef and lamb carcasses.	IR	I	I	I	I	R	
determine percent yield on wholesale cuts of beef, pork and lamb.	IR	I	IRM	I	IRM	IRM	
rank breeding bulls, cows and replacement heifers on structure, soundness and EPD's according to production data.	IR	I	I	I	I	R	
examine the properties that affect growth, composition and maturity on pigs, cattle and lambs.	IR	I	I	I	I	R	

	AS/AAS						
	CERT B: Agronomy						
	CERT B: Agribusiness Specialist: Livestock (CERTA + 15 hrs. electives)						
	CERT A: Agribusiness						
ANSI 110 Swine Production	*Curriculum Mapping*						
	Program Outcomes: analyze the current events and issues that are occurring in agriculture.	examine the relationships between inputs and outputs in their agricultural field to make effective and profitable decisions.	explore aspects of agriculture used by scientists, marketers and producers.	apply existing and emerging knowledge and technologies.	apply management and marketing skills.	compare marketing and husbandry of several different animal species.	explain crop production concepts, range management and soil management.
Course SLO: Students will be able to							
understand the history of the swine industry.	R	I	I	R	I	I	
describe and recognize the different breeds of swine.	R	I	I	R	I	I	
understand and define terms in swine nutrition as well as requirements for growth and the function of the digestive system.	R	I	I	R	I	I	
understand swine reproduction and swine genetics.	R	I	I	R	I	I	
define various swine health issues and how to maintain a health program.	R	I	I	R	I	I	
discuss various swine management programs (free-range, indoors, etc.).	I	IRM	IRM	R	I	I	

	IR						
	CERT B: Agronomy						
	CERT B: Agribusiness Specialist: Livestock (CERTA + 15 hrs. electives)						
	CERT A: Agribusiness						

ANSI 111 Farm Animal Reproduction	*Curriculum Mapping*						
Program Outcomes	analyze the current events and issues that are occurring in agriculture.	examine the relationships between inputs and outputs in their agricultural field to make effective and profitable decisions.	explore aspects of agriculture used by scientists, marketers and producers.	apply existing and emerging knowledge and technologies.	apply management and marketing skills.	compare marketing and husbandry of several different animal species.	explain crop production concepts, range management and soil management.
Course SLO: Students will be able to							
describe, define, differentiate and locate the different anatomy, functions and regulation of the male and female reproductive tracts.	IR	IR	IR	R	I	R	
describe and define natural synchronization processes in females.	IR	IR	IR	R	I	R	
illustrate the estrous cycle in females and spermatogenesis in males.	IR	IR	IR	R	I	R	
discuss gestation length and give descriptive analysis on the formation of an embryo, fetus and young during gestation.	IR	IR	IR	R	I	R	
describe the steps leading to parturition and what hormones are required for the process.	IR	IR	IR	R	I	R	
discuss the process of lactation and how it is regulated in the female body.	IR	IR	IR	R	I	R	

elaborate on the history of artificial insemination, including who, what, when, where and why it was first used.	IR	IR	IR	IRM	I	R	
discuss the changes in modern years in artificial insemination.	IR	IR	IR	IRM	I	R	
grade the vitality, viability and motility of semen from bulls, boars, rams or stallions.	IR	IR	IR	R	I	RM	
contrast the differences in pregnancy between different farm animals.	IR	IR	IR	R	I	RM	
summarize the different genetic and infectious disease/causes of reproductive failure and problems associated with gestation.	IR	IR	IR	R	I	R	

		AS/AAS							
		CERT B: Agronomy							
		CERT B: Agribusiness Specialist: Livestock (CERTA + 15 hrs. electives)							
		CERT A: Agribusiness							
ANSI 1110 Farm Animal Reproduction Lab		*Curriculum Mapping*							
	Program Outcomes	analyze the current events and issues that are occurring in agriculture.	examine the relationships between inputs and outputs in their agricultural field to make effective and profitable decisions.	explore aspects of agriculture used by scientists, marketers and producers.	apply existing and emerging knowledge and technologies.	apply management and marketing skills.	compare marketing and husbandry of several different animal species.	explain crop production concepts, range management and soil management.
Course SLO: Students will be able to								
describe, define and differentiate the different anatomical structures and know the function, regulation mechanism in the male and female reproductive tracts.		I	I	I	R	I	I	
describe and define natural synchronization processes in females.		I	I	I	R	I	I	
illustrate the estrous cycle in females and spermatogenesis in males.		I	I	I	R	I	I	
discuss gestation length and give descriptive analysis on the formation of an embryo, fetus and young during gestation.		I	I	I	R	I	I	
describe the steps leading to parturition and what hormones are required for the process.		I	I	I	R	I	I	
discuss the process of lactation and how it is regulated in the female body.		I	I	I	R	I	I	

elaborate on the history of artificial insemination, including who, what, when, where and why it was first used.	I	I	I	IRM	I	I	
discuss the changes in modern years in artificial insemination.	I	I	I	IRM	I	I	
grade the vitality, viability and motility of semen from bulls, boars, rams or stallions.	I	I	I	R	I	IRM	
contrast the differences in pregnancy between different farm animals.	I	I	I	R	I	IRM	
summarize the different genetic and infectious disease/causes of reproductive failure and problems associated with gestation.	I	I	I	R	I	I	

	AS/AAS						
	CERT B: Agronomy						
	CERT B: Agribusiness Specialist: Livestock (CERTA + 15 hrs. electives)						
	CERT A: Agribusiness						
ANSI 120: Special Topics in Livestock Management	*Curriculum Mapping*						
Program Outcomes	analyze the current events and issues that are occurring in agriculture.	examine the relationships between inputs and outputs in their agricultural field to make effective and profitable decisions.	explore aspects of agriculture used by scientists, marketers and producers.	apply existing and emerging knowledge and technologies.	apply management and marketing skills.	compare marketing and husbandry of several different animal species.	explain crop production concepts, range management and soil management.
Course SLO: Students will be able to							
thoroughly research a given topic, citing both sides of an issue.	I	I	I	IR	R	R	
write and understand a scientific paper with at least 5-10 sources for your topic.	I	I	IRM	IR	R	IRM	
calculate daily prices for carcass cattle based on grid pricing from USDA and live pricing available from USDA-AMS.	I	I	I	IR	RM	R	
present a topic for discussion and participate in classroom rhetoric.	I	I	I	IR	R	R	
describe current research topics in Animal Science.	I	I	I	IR	R	R	
discuss current biotechnology situation and relate the importance it has on animal agriculture.	I	I	I	IRM	R	R	
discuss the local water and environmental laws and how they might influence industries from coming or leaving an area.	I	I	I	IR	R	R	

utilize USDA grid pricing schemes to determine cough of rough treatment and handling in feedlot cattle and slaughter hogs.	I	I	I	IRM	R	R	
find information about USDA Food recalls for food safety and microbiological reasons and determine how they affect wholesalers, retailers and consumers.	I	I	IRM	IRM	R	R	

ANSI 129 Meat & Carcass Evaluation	Curriculum Mapping						
	AS/AAS						
	CERT B: Agronomy						
	CERT B: Agribusiness Specialist: Livestock (CERTA + 15 hrs. electives)						
	CERT A: Agribusiness						
Program Outcomes	analyze the current events and issues that are occurring in agriculture.	examine the relationships between inputs and outputs in their agricultural field to make effective and profitable decisions.	explore aspects of agriculture used by scientists, marketers and producers.	apply existing and emerging knowledge and technologies.	apply management and marketing skills.	compare marketing and husbandry of several different animal species.	explain crop production concepts, range management and soil management.
Course SLO: Students will be able to							
reconstruct the yield grade equation from base numbers to numerical terms.	IR	IR	IR	R	R	R	
measure a beef ribeye within 2 tenths of an inch.	IR	IR	IR	R	R	R	
calculate the weight and ribeye adjustment for the yield grade equation.	IR	IR	IR	R	R	R	
compare and contrast USDA Yield Grade 1 with a USDA Yield Grade 5.	IR	IR	IR	R	R	R	
evaluate the difference between fat thicknesses in beef carcasses.	IR	IR	IR	R	R	R	
reconstruct the maturity and marbling relation chart to determine USDA Quality Grades.	IR	IR	IR	R	R	R	
conduct a grading rail with a minimum of 250 points combined score.	IR	IR	IR	R	R	R	
compare bone maturity between mature and youthful carcasses.	IR	IR	IR	R	R	R	
rank a class of beef carcasses based on quality and yield grades.	IR	IR	IR	R	R	R	

arrange notes to answer questions on beef quality classes.	IR	IR	IR	R	R	R
determine the cutability and quality limits for unacceptable beef.	IR	IR	IR	R	R	R
evaluate classes of pork carcasses, hams, and loins on quality attributes.	IR	IR	IR	R	R	R
determine final ranking of a lamb carcass class.	IR	IR	IR	R	R	R
analyze a class on note cards for written questions.	IR	IR	IR	R	R	R
rank a class to 90% accuracy.	IR	IR	IR	R	R	R
compare the PYG of the USDA Yield Grading system to tenths of inches.	IR	IR	IR	RM	R	R
determine the difference in1 square inch of ribeye in beef, pork and lamb.	IR	IR	IR	R	R	R
organize note cards for efficiency studying and review of notes.	IR	IR	IR	R	R	R
arrange a class with a learning topic for students with questions.	IR	IR	IR	R	R	R
defend a placing of a class in a contest.	IR	IR	IR	R	R	R
calculate the US grading scheme for pork carcasses.	IR	IR	IR	R	R	R
calculate percent muscle on a pork carcass.	IR	IR	IR	R	R	R
differentiate between PSE, RFN and DFD pork.	IR	IR	IR	R	R	R
relate the value of placing beef carcasses using a grid pricing system.	IR	IR	IR	R	R	R
list and differentiate between various cut locations in beef: ribeye, lower rib, round, inside round, sirloin, loin, rib, chuck, brisket, cod/udder, and KPH.	IR	IR	IR	R	R	R

list and differentiate between various cut locations of a pork carcass: loineye, lower rib, ham, sirloin, loin, center loin, first rib, last rib, last lumbar, collar, clear plate, belly pocket, navel edge, sternum, Boston and picnic shoulder and exposed lumbar lean.	IR	IR	IR	R	R	R	
list and differentiate between various cuts/regions on a lamb carcass: leg, sirloin, dock, rack, loin, shoulder, crotch, kidney, pelvic, flank, cod/udder, stifle joint, breast, neck, break joints, spool joins, primary and secondary flanks.	IR	IR	IR	R	R	R	
describe the basic quality factors for beef, pork and lamb.	IR	IR	IR	R	RM	R	
design an effective method for taking notes on questions classes.	IR	IR	IR	R	R	R	
discriminate between acceptable and unacceptable quality and cutability.	IR	IR	IR	R	R	R	

	AS/AAS							
	CERT B: Agronomy							
	CERT B: Agribusiness Specialist: Livestock (CERTA + 15 hrs. electives)							
	CERT A: Agribusiness							

ANSI 130 Classification, Grading & Selection of Meats

Curriculum Mapping

Course SLO: Students will be able to	Program Outcomes	analyze the current events and issues that are occurring in agriculture.	examine the relationships between inputs and outputs in their agricultural field to make effective and profitable decisions.	explore aspects of agriculture used by scientists, marketers and producers.	apply existing and emerging knowledge and technologies.	apply management and marketing skills.	compare marketing and husbandry of several different animal species.	explain crop production concepts, range management and soil management.
reconstruct the yield grade equation from base numbers to numerical terms.		IR	IR	IR	R	R	R	
measure a beef ribeye within 2 tenths of an inch.		IR	IR	IR	R	R	R	
calculate the weight and ribeye adjustment for the yield grade equation.		IR	IR	IR	R	R	R	
compare and contrast USDA Yield Grade 1 with a USDA Yield Grade 5.		IR	IR	IR	R	R	R	
evaluate the difference between fat thicknesses in beef carcasses.		IR	IR	IR	R	R	R	
reconstruct the maturity and marbling relation chart to determine USDA Quality Grades.		IR	IR	IR	R	R	R	
conduct a grading rail with a minimum of 250 points combined score.		IR	IR	IR	R	R	R	
compare bone maturity between mature and youthful carcasses.		IR	IR	IR	R	R	R	
rank a class of beef carcasses based on quality and yield grades.		IR	IR	IR	R	R	R	

arrange notes to answer questions on beef quality classes.	IR	IR	IR	R	R	R	
determine the cutability and quality limits for unacceptable beef.	IR	IR	IR	R	R	R	
evaluate classes of pork carcasses, hams, and loins on quality attributes.	IR	IR	IR	R	R	R	
determine final ranking of a lamb carcass class.	IR	IR	IR	R	R	R	
analyze a class on note cards for written questions.	IR	IR	IR	R	R	R	
rank a class to 90% accuracy.	IR	IR	IR	R	R	R	
compare the PYG of the USDA Yield Grading system to tenths of inches.	IR	IR	IR	R	R	R	
determine the difference in 1 square inch of ribeye in beef, pork and lamb.	IR	IR	IR	R	R	R	
organize note cards for efficiency studying and review of notes.	IR	IR	IR	R	R	R	
arrange a class with a learning topic for students with questions.	IR	IR	IR	R	R	R	
defend a placing of a class in a contest.	IR	IR	IR	R	R	R	
calculate the US grading scheme for pork carcasses.	IR	IR	IR	R	R	R	
calculate percent muscle on a pork carcass.	IR	IR	IR	R	R	R	
differentiate between PSE, RFN and DFD pork.	IR	IR	IR	R	R	R	
relate the value of placing beef carcasses using a grid pricing system.	IR	IR	IR	R	R	R	
list and differentiate between various cut locations in beef: ribeye, lower rib, round, inside round, sirloin, loin, rib, chuck, brisket, cod/udder, and KPH.	IR	IR	IR	R	R	R	

list and differentiate between various cut locations of a pork carcass: loineye, lower rib, ham, sirloin, loin, center loin, first rib, last rib, last lumbar, collar, clear plate, belly pocket, navel edge, sternum, Boston and picnic shoulder and exposed lumbar lean.	IR	IR	IR	R	R	R	
list and differentiate between various cuts/regions on a lamb carcass: leg, sirloin, dock, rack, loin, shoulder, crotch, kidney, pelvic, flank, cod/udder, stifle joint, breast, neck, break joints, spool joins, primary and secondary flanks.	IR	IR	IR	R	R	R	
describe the basic quality factors for beef, pork and lamb.	IR	IR	IR	R	R	R	
design an effective method for taking notes on questions classes.	IR	IR	IR	R	R	R	
discriminate between acceptable and unacceptable quality and cutability.	IR	IR	IR	R	R	IRM	

AS/AAS						
CERT B: Agronomy						
CERT B: Agribusiness Specialist: Livestock (CERTA + 15 hrs. electives)						
CERT A: Agribusiness						

ANSI 131 Introduction to Food Science — *Curriculum Mapping*

Course SLO: Students will be able to	analyze the current events and issues that are occurring in agriculture.	examine the relationships between inputs and outputs in their agricultural field to make effective and profitable decisions.	explore aspects of agriculture used by scientists, marketers and producers.	apply existing and emerging knowledge and technologies.	apply management and marketing skills.	compare marketing and husbandry of several different animal species.	explain crop production concepts, range management and soil management.
define the new opportunities in the food service industry from present challenges.	I	I	IR	I	IRM	R	
list the various types of food establishments in the US.	I	I	IR	I	IRM	R	
describe and define the terms foodborne illness and foodborne outbreak.	I	I	IRM	I	I	R	
describe susceptible people to foodborne illness infections.	I	I	IR	I	I	R	
define the different food sensory characteristics.	I	I	IR	I	I	R	
compare and contrast different economics that influence food consumption and production.	I	I	IR	I	IRM	R	
define differences in heat transfer and microwave cooking.	I	I	IR	I	I	R	
illustrate the differences in composition of food items.	I	I	IR	I	I	R	
note types of food ingredients found in desserts, frozen foods, pastry, breads and quick breads.	I	I	IR	I	I	R	

describe components and nutritional values of fruits and vegetables.	I	I	IR	I	I	R	
compare, contrast and describe the nutritional values and components of milk, eggs, meat and seafood in a healthy diet.	I	I	IR	I	I	R	
describe the role of beverages noting the most consumed in the US	I	I	IRM	I	I	R	
describe methods of food packaging and preservation.	I	I	IR	I	I	R	
define methods of freezing and canning foods as well as nutritional changes in these forms of storage.	I		IR	I	I	R	

AS/AAS							
CERT B: Agronomy							
CERT B: Agribusiness Specialist: Livestock (CERTA + 15 hrs. electives)							
CERT A: Agribusiness							

ANSI 135 ServSafe — *Curriculum Mapping*

Course SLO: Students will be able to	analyze the current events and issues that are occurring in agriculture.	examine the relationships between inputs and outputs in their agricultural field to make effective and profitable decisions.	explore aspects of agriculture used by scientists, marketers and producers.	apply existing and emerging knowledge and technologies.	apply management and marketing skills.	compare marketing and husbandry of several different animal species.	explain crop production concepts, range management and soil management.
define and describe the various types of foodborne illness.	I	I	I	I	I	R	
understand concepts to prevent foodborne illness outbreaks.	I	I	I	I	I	R	
list and describe various practices to ensure food safety.	I	I	I	I	I	R	
describe and define the term pathogen.	I	I	I	I	I	R	
list the disease, symptoms, onset, duration, illness and other specifics about viruses, bacteria, parasites, fungi, biological toxins and emerging pathogens in foods.	I	I	I	I	I	IRM	
compare and contrast the varying chemical, biological and physical contaminants in foods.	I	I	IRM	I	I	R	
list and describe various food handling techniques for safety and note the importance of good personal hygiene.	I	I	IRM	I	I	R	

extrapolate on the topic of the flow of food from preventing cross-contamination, general storage guidelines, preparing food (thawing, cooking requirement temperatures and reheating food) to food service.	I	I	I	I	I	R	
define various prerequisite food safety programs included in HACCP.	I	I	I	I	I	R	
design a sanitation regime for a food service facility in regards to cleaning, sanitation and equipment standards for installation and maintenance of equipment and facilities.	I	I	I	I	I	R	
compare, contrast and define the differences between cleaning and sanitizing noting various tools for each.	I	I	I	I	IRM	R	
describe and develop an integrated pest management system with treatment, control measures, identification of pests and procedures for using and storing chemicals.	I	I	I	I	I	R	
define the objectives of a food service inspection program as well as the governmental regulatory system for foods.	I	I	I	I	IRM	R	
briefly describe the FDA Food Code; how and why it was established and what it does for the industry.	I	I	I	I	I	R	

	AS/AAS						
	CERT B: Agronomy						
	CERT B: Agribusiness Specialist: Livestock (CERTA + 15 hrs. electives)						
	CERT A: Agribusiness						
ANSI 140 Horse Science	*Curriculum Mapping*						
Program Outcomes	analyze the current events and issues that are occurring in agriculture.	examine the relationships between inputs and outputs in their agricultural field to make effective and profitable decisions.	explore aspects of agriculture used by scientists, marketers and producers.	apply existing and emerging knowledge and technologies.	apply management and marketing skills.	compare marketing and husbandry of several different animal species.	explain crop production concepts, range management and soil management.
Course SLO: Students will be able to							
identify major historical steps in the development of the horse industry.	R	I	I	R	I	I	
identify the role of horse in society.	R	I	I	R	I	I	
describe the responsibilities associated with horse ownership.	R	I	I	R	I	I	
list the major breeds of horses and their characteristics.	R	I	I	R	I	I	
identify the major parts of the horse body.	R	I	I	R	I	I	
describe the correct conformation of a horse.	R	I	I	R	I	I	
identify major unsoundness of horses.	R	I	I	R	I	I	
describe proper foot care of horses.	R	I	I	R	I	I	
describe major diseases and parasites that affect horses.	R	I	I	R	I	I	
describe the nutritional requirements in various stages of production.	R	I	I	R	I	I	
describe the proper methods of creating horse rations.	I	IRM	I	R	I	I	

describe the proper timing and methods of feeding horses.	R	IRM	I	R	I	I
identify parts and functions of the reproductive tract.	R	I	I	R	I	I
describe the process of breeding a female horse.	R	I	IRM	R	I	I
describe proper method of controlling a stallion.	R	I	I	R	I	I
describe the use of AI and breeding soundness evaluation.	R	I	I	IRM	I	I
describe the proper care for the foal and dam at foaling time.	R	I	I	R	I	I
describe the proper materials and arrangement for horse facilities.	I	I	I	IRM	I	I
describe the proper methods of restraint.	R	I	I	R	I	I
outline proper methods of grooming.	I	I	I	R	I	I
list equipment necessary for riding, grooming and care.	R	I	I	R	I	I
describe the importance of racing, showing and other horse events.	I	I	I	I	I	I

AS/AAS							
CERT B: Agronomy							
CERT B: Agribusiness Specialist: Livestock (CERTA + 15 hrs. electives)							
CERT A: Agribusiness							

ANSI 141 Horsemanship — *Curriculum Mapping*

Course SLO: Students will be able to / Program Outcomes	analyze the current events and issues that are occurring in agriculture.	examine the relationships between inputs and outputs in their agricultural field to make effective and profitable decisions.	explore aspects of agriculture used by scientists, marketers and producers.	apply existing and emerging knowledge and technologies.	apply management and marketing skills.	compare marketing and husbandry of several different animal species.	explain crop production concepts, range management and soil management.
explain and understand the significance of horsemanship from a historical and modern day viewpoint.	R	I	I	R	I	I	
distinguish the different philosophies of riding cowboy style versus show arena style.	R	I	I	R	I	I	
determine the characteristics needed in a horse for each individual rider.	R	IRM	I	R	I	I	
calculate the cost of owning different types of horses.	R	I	I	R	IRM	I	
compare different types of tack for each individual purpose.	R	I	I	R	I	I	
demonstrate proper means of storing and caring for tack.	R	I	I	R	I	I	
discuss the many tools involved in grooming of horses.	R	I	I	R	I	I	
practice essential grooming techniques.	R	I	I	R	I	I	
discuss safe handling of horses.	R	I	I	R	I	I	
explain different techniques of maintaining soundness.	R	I	I	R	I	I	
describe proper riding attire.	R	I	I	R	I	I	

demonstrate the proper method of saddling a horse.	R	I	I	R	I	I	
discuss the ramifications of a poor fitting saddle and pad combination.	R	I	I	R	I	I	
apply riding techniques to various riding disciplines.	R	I	I	R	I	I	
demonstrate an assortment of basic training principles.	R	I	I	R	IRM	I	

AS/AAS							
CERT B: Agronomy							
CERT B: Agribusiness Specialist: Livestock (CERTA + 15 hrs. electives)							
CERT A: Agribusiness							

ANSI 206 Principles of Meat Evaluation

Curriculum Mapping

Course SLO: Students will be able to	analyze the current events and issues that are occurring in agriculture.	examine the relationships between inputs and outputs in their agricultural field to make effective and profitable decisions.	explore aspects of agriculture used by scientists, marketers and producers.	apply existing and emerging knowledge and technologies.	apply management and marketing skills.	compare marketing and husbandry of several different animal species.	explain crop production concepts, range management and soil management.
reconstruct the yield grade equation from base numbers to numerical terms.	IR	IR	IR	R	I	R	
measure a beef ribeye within 2 tenths of an inch.	IR	IR	IR	R	I	R	
calculate the weight and ribeye adjustment for the yield grade equation.	IR	IR	IR	R	I	R	
compare and contrast USDA Yield Grade 1 with a USDA Yield Grade 5.	IR	IR	IR	R	I	R	
evaluate the difference between fat thicknesses in beef carcasses.	IR	IR	IR	R	I	R	
reconstruct the maturity and marbling relation chart to determine USDA Quality Grades.	IR	IR	IR	R	I	R	
conduct a grading rail with a minimum of 250 points combined score.	IR	IR	IR	R	I	R	
compare bone maturity between mature and youthful carcasses.	IR	IR	IR	R	I	R	

rank a class of beef carcasses based on quality and yield grades.	IR	IR	IR	R	IRM	R	
arrange notes to answer questions on beef quality classes.	IR	IR	IR	R	I	R	
determine the cutability and quality limits for unacceptable beef.	IR	IR	IR	R	I	R	
evaluate classes of pork carcasses, hams, and loins on quality attributes.	IR	IR	IR	R	I	R	
determine final ranking of a lamb carcass class.	IR	IR	IR	R	I	R	
analyze a class on note cards for written questions.	IR	IR	IR	R	I	R	
rank a class to 90% accuracy.	IR	IR	IR	R	I	R	
compare the PYG of the USDA Yield Grading system to tenths of inches.	IR	IR	IR	R	I	R	
determine the difference in 1 square inch of ribeye in beef, pork and lamb.	IR	IR	IR	R	I	R	
organize note cards for efficiency studying and review of notes.	IR	IR	IR	R	I	R	
arrange a class with a learning topic for students with questions.	IR	IR	IR	R	I	R	
defend a placing of a class in a contest.	IR	IR	IR	R	I	R	
calculate the US grading scheme for pork carcasses.	IR	IR	IR	R	I	R	
calculate percent muscle on a pork carcass.	IR	IR	IR	R	I	R	
differentiate between PSE, RFN and DFD pork.	IR	IR	IR	R	I	R	
relate the value of placing beef carcasses using a grid pricing system.	IR	IR	IR	R	I	R	
list and differentiate between various cut locations in beef: ribeye, lower rib, round, inside round, sirloin, loin, rib, chuck, brisket, cod/udder, and KPH.	IR	IR	IR	R	I	R	

Objective						
list and differentiate between various cut locations of a pork carcass: loineye, lower rib, ham, sirloin, loin, center loin, first rib, last rib, last lumbar, collar, clear plate, belly pocket, navel edge, sternum, Boston and picnic shoulder and exposed lumbar lean.	IR	IR	IR	R	I	R	
list and differentiate between various cuts/regions on a lamb carcass: leg, sirloin, dock, rack, loin, shoulder, crotch, kidney, pelvic, flank, cod/udder, stifle joint, breast, neck, break joints, spool joins, primary and secondary flanks.	IR	IR	IR	R	I	R	
describe the basic quality factors for beef, pork and lamb.	IR	IR	IR	R	I	IRM	
design an effective method for taking notes on questions classes.	IR	IR	IR	R	I	R	
discriminate between acceptable and unacceptable quality and cutability.	IR	IR	IR	R	I	R	

AS/AAS							
CERT B: Agronomy							
CERT B: Agribusiness Specialist: Livestock (CERTA + 15 hrs. electives)							
CERT A: Agribusiness							

ANSI 207 Principles of Meat Science — *Curriculum Mapping*

Course SLO: Students will be able to	analyze the current events and issues that are occurring in agriculture.	examine the relationships between inputs and outputs in their agricultural field to make effective and profitable decisions.	explore aspects of agriculture used by scientists, marketers and producers.	apply existing and emerging knowledge and technologies.	apply management and marketing skills.	compare marketing and husbandry of several different animal species.	explain crop production concepts, range management and soil management.
explain and analyze the structure and composition of muscle and associated tissues.	IR	IR	IR	I	I	R	
outline and diagram the growth and development of carcass tissues.	IR	IR	IR	I	I	R	
explain and illustrate the mechanism of muscle contraction and relaxation.	IR	IR	IR	I	I	R	
discuss the conversion of muscle to meat.	IR	IR	IR	I	I	R	
explain the development of meat quality postmortem.	IR	IR	IR	I	I	R	
list and discuss the properties of fresh meat.	IR	IR	IR	I	I	R	
define the principles of meat processing.	IR	IR	IR	I	I	R	
examine the effects and prevention of microorganisms in meat products.	IR	IR	IR	I	I	R	
discuss deterioration and contamination of meat products.	IR	IR	IR	IRM	I	R	
list and discuss proper storage and preservation of meat products.	IR	IR	IR	IRM	I	R	

explain the role of meat merchandizing.	IR	IR	IR	I	I	R	
discuss meat in the foodservice setting.	IR	IR	IR	I	I	R	
define the factors that contribute the palpability of meat.	IR	IR	IR	I	I	R	
list and describe the proper cookery of meat products.	IR	IR	IR	I	I	R	
examine the nutritional value of meat products.	IR	IR	IR	I	I	IRM	
compare and contrast meat inspection and meat grading.	IR	IR	IR	I	I	R	
analyze meat products through evaluation.	IR	IR	IR	I	IRM	R	
discuss the role of by-products in the meat industry.	IR	IR	IR	I	I	R	

	AS/AAS							
	CERT B: Agronomy							
	CERT B: Agribusiness Specialist: Livestock (CERTA + 15 hrs. electives)							
	CERT A: Agribusiness							

ANSI 213 Animal Handling & Welfare	*Curriculum Mapping*							
Program Outcomes	analyze the current events and issues that are occurring in agriculture.	examine the relationships between inputs and outputs in their agricultural field to make effective and profitable decisions.	explore aspects of agriculture used by scientists, marketers and producers.	apply existing and emerging knowledge and technologies.	apply management and marketing skills.	compare marketing and husbandry of several different animal species.	explain crop production concepts, range management and soil management.
Course SLO: Students will be able to							
identify proper animal handling guidelines for on the farm, ranch or feedlot.	IR	IR	IR	IR	R	IRM	
analyze correct transportation guidelines for animal safety and welfare.	IR	IR	IR	IR	IRM	R	
evaluate steps utilized in proper handling in harvest operations.	IR	IR	IR	IR	R	R	
explain different techniques for appropriate usage of antibiotics and animal health products.	IR	IR	IRM	IR	R	R	

	AS/AAS						
	CERT B: Agronomy						
	CERT B: Agribusiness Specialist: Livestock (CERTA + 15 hrs. electives)						
	CERT A: Agribusiness						
ANSI 215 Introduction to Food Law	*Curriculum Mapping*						
Program Outcomes	**analyze the current events and issues that are occurring in agriculture.**	**examine the relationships between inputs and outputs in their agricultural field to make effective and profitable decisions.**	**explore aspects of agriculture used by scientists, marketers and producers.**	**apply existing and emerging knowledge and technologies.**	**apply management and marketing skills.**	**compare marketing and husbandry of several different animal species.**	**explain crop production concepts, range management and soil management.**
Course SLO: Students will be able to							
describe the history of food regulation in the United States and identify the major food regulations.	IR	IR	IR	R	I	R	
identify and describe the agencies responsible for food regulation and oversight at the local, state, national, and international level.	IR	IR	IR	R	IRM	R	
understand which agencies have jurisdiction over various food products.	IR	IR	IR	R	IRM	R	
utilize federal and state resources to identify and apply regulations specific to a particular food product.	IR	IR	IRM	R	I	R	
determine the regulatory guidelines and constraints for development of a new food product or reformulation of an existing product.	IR	IR	IR	R	IRM	R	
effectively communicate in writing with peers and non-scientists regarding current issues in food law.	IR	IR	IR	R	IRM	R	
understand the required components of a food label.	IR	IR	IR	R	IRM	R	
explain the meaning of food label claims.	IR	IR	IRM	R	I	R	

	AS/AAS								
	CERT B: Agronomy								
	CERT B: Agribusiness Specialist: Livestock (CERTA + 15 hrs. electives)								
	CERT A: Agribusiness								
ANSI 216 Principles of Meat Processing and Fabrication	*Curriculum Mapping*								
	Program Outcomes	analyze the current events and issues that are occurring in agriculture.	examine the relationships between inputs and outputs in their agricultural field to make effective and profitable decisions.	explore aspects of agriculture used by scientists, marketers and producers.	apply existing and emerging knowledge and technologies.	apply management and marketing skills.	compare marketing and husbandry of several different animal species.	explain crop production concepts, range management and soil management.
Course SLO: Students will be able to									
explain the history of meat processing and fabrication.		I	I	I	R	R	R	
describe the role of preservation in meat processing.		I	I	I	IRM	RM	R	
extrapolate the importance of sanitation in meat processing.		I	IRM	I	IRM	R	R	
demonstrate the process of fabrication of a beef carcass into primal, wholesale and retail cuts.		I	IRM	I	R	R	R	
demonstrate the process of fabrication of a pork carcass into primal, wholesale and retail cuts.		I	IRM	I	R	R	R	
demonstrate the process of fabrication of a sheep carcass into primal, wholesale and retail cuts.		I	IRM	I	R	R	R	
define the correct skills for sharpening a knife including correct honing angles.		I	I	I	R	R	R	
list and describe the proper personal protective equipment necessary for safe processing.		I	I	I	R	R	R	

demonstrate proper usage of culinary and butchering equipment used in meat processing.	I	I	I	R	R	R	
describe the process for labeling of meat products from a regulatory standard.	I	I	I	R	R	R	

AS/AAS							
CERT B: Agronomy							
CERT B: Agribusiness Specialist: Livestock (CERTA + 15 hrs. electives)							
CERT A: Agribusiness							

ANSI 217 Principles of Artificial Insemination — *Curriculum Mapping*

Course SLO: Students will be able to	Program Outcomes / analyze the current events and issues that are occurring in agriculture.	examine the relationships between inputs and outputs in their agricultural field to make effective and profitable decisions.	explore aspects of agriculture used by scientists, marketers and producers.	apply existing and emerging knowledge and technologies.	apply management and marketing skills.	compare marketing and husbandry of several different animal species.	explain crop production concepts, range management and soil management.
explain the history of artificial insemination.	IR	IR	I	R	I	I	
describe the role of collecting, storing and sorting semen from intact males.	IR	IR	I	R	I	I	
extrapolate the importance of sanitation in artificial insemination.	IR	IR	I	R	IRM	I	
demonstrate the process of insemination in beef cattle.	IR	IR	I	R	I	IRM	
demonstrate the process of insemination in pigs.	IR	IR	I	R	I	IRM	
explain the process of insemination in sheep and horses.	IR	IR	I	R	I	IRM	
define the correct skills for placement of semen in recipient females.	IR	IR	I	R	I	I	
list and describe the proper sanitary equipment used in artificial insemination.	IR	IR	I	R	I	I	
explain the proper storage techniques for semen in liquid nitrogen.	IR	IR	I	RM	I	I	
define the usage of EPD's (Expected Progeny Difference) to match the correct sire with dam.	IR	IR	I	RM	I	I	

ANSI 250 Animal Genetics	Program Outcomes	AS/AAS						
		CERT B: Agronomy						
		CERT B: Agribusiness Specialist: Livestock (CERTA + 15 hrs. electives)						
		CERT A: Agribusiness						
		Curriculum Mapping						
		analyze the current events and issues that are occurring in agriculture.	examine the relationships between inputs and outputs in their agricultural field to make effective and profitable decisions.	explore aspects of agriculture used by scientists, marketers and producers.	apply existing and emerging knowledge and technologies.	apply management and marketing skills.	compare marketing and husbandry of several different animal species.	explain crop production concepts, range management and soil management.
Course SLO: Students will be able to								
describe and define the role of genetics in the biology of animals.		IR	IR	I	R	R	R	
describe and differentiate among population, quantitative, evolutionary and molecular genetics of animals.		IR	IR	IRM	R	R	R	
illustrate the inheritance of genes relative to Mendelian Genetics and genetic terminology.		IR	IR	I	R	R	R	
discuss DNA replication and recombination as well as RNA molecules and RNA processing.		IR	IR	I	R	R	R	
describe developmental genetics, cancer genetics, genomics, proteomics and immunogenetics.		IR	IR	I	R	R	R	
discuss chromosome variation, bacterial and viral genetics schemes.		IR	IR	I	R	R	R	
elaborate on linkage, recombination and eukaryotic gene mapping.		IR	IR	I	R	R	R	

discuss the history of genetics, genetic diversity, the rise of science in genetics, the early use and understanding of heredity and changes in modern years.	IR	IR	I	R	R	R	
compare genetic expected progeny differences among different breeds of farm animals and understand the terminology presented in sire summaries.	IR	IR	I	R	R	IRM	
contrast the difference in types of heritability and phenotypic variance.	IR	IR	I	RM	R	R	
calculate genetic and allelic frequencies used to describe a gene pool of a population.	IR	IR	I	RM	R	R	

WELD 110 Introduction to AWS Welding	AS/AAS							
	CERT B: Agronomy							
	CERT B: Agribusiness Specialist: Livestock (CERTA + 15 hrs. electives)							
	CERT A: Agribusiness							
	Curriculum Mapping							
Program Outcomes	analyze the current events and issues that are occurring in agriculture.	examine the relationships between inputs and outputs in their agricultural field to make effective and profitable decisions.	explore aspects of agriculture used by scientists, marketers and producers.	apply existing and emerging knowledge and technologies.	apply management and marketing skills.	compare marketing and husbandry of several different animal species.	explain crop production concepts, range management and soil management.
Course SLO: Students will be able to							
explain, safely set up, adjust, join metals by welding, and stow SMAW, GTAW, and GMAW equipment.	I	IRM	I	I	I		
weld mild carbon steel in flat, vertical, and overhead positions utilizing the SMAW, GTAW, Or GMAW processes.	I	IRM	I	I	I		

AS/AAS						
CERT B: Agronomy						
CERT B: Agribusiness Specialist: Livestock (CERTA + 15 hrs. electives)						
CERT A: Agribusiness						

AGRO 101 Crops — *Curriculum Mapping*

Course SLO: Students will be able to	analyze the current events and issues that are occurring in agriculture.	examine the relationships between inputs and outputs in their agricultural field to make effective and profitable decisions.	explore aspects of agriculture used by scientists, marketers and producers.	apply existing and emerging knowledge and technologies.	apply management and marketing skills.	compare marketing and husbandry of several different animal species.	explain crop production concepts, range management and soil management.
visualize development of agriculture.	R	I	I	R	I		I
identify crop terminology.	R	I	I	R	I		I
examine agro ecology.	R	IRM	I	R	I		I
identify crop production systems.	R	I	I	IRM	IRM		IRM
classify soil types.	R	I	I	R	I		I
examine seeds and seeding.	R	I	IRM	IRM	I		IRM
analyze crop roots.	R	I	I	R	I		I
classify crop stems and leaves.	R	I	I	R	I		I
discover photosynthesis and respiration.	R	I	I	R	I		I
classify flowering and reproduction.	R	I	I	R	I		IRM
evaluate crop improvement.	R	IRM	IRM	IRM	IRM		I
identify diseases, pests and weeds.	R	I	IRM	IRM	I		I

Program Outcomes

AS/AAS								
	CERT B: Agronomy							
	CERT B: Agribusiness Specialist: Livestock (CERTA + 15 hrs. electives)							
	CERT A: Agribusiness							
AGRO 103 Soils & Soils Lab	*Curriculum Mapping*							
Program Outcomes	**analyze the current events and issues that are occurring in agriculture.**	**examine the relationships between inputs and outputs in their agricultural field to make effective and profitable decisions.**	**explore aspects of agriculture used by scientists, marketers and producers.**	**apply existing and emerging knowledge and technologies.**	**apply management and marketing skills.**	**compare marketing and husbandry of several different animal species.**	**explain crop production concepts, range management and soil management.**
Course SLO: Students will be able to							
distinguish the importance of soil.	R	I	R	I	I		I
identify soil origin and development.	R	I	RM	I	I		I
describe soil classification and survey.	R	I	R	IRM	I		I
define physical properties of soil.	R	I	R	I	I		I
appraise soil water.	R	I	R	I	I		I
validate water conservation.	R	I	R	I	IRM		IRM
evaluate drainage and irrigation.	R	I	R	I	I		I
classify life in the soil.	R	I	RM	IRM	I		I
distinguish organic matter.	R	I	R	I	I		I
translate soil fertility.	R	I	R	I	I		IRM
compute soil ph.	R	I	R	I	I		I
explain plant nutrition.	R	I	R	I	I		I
identify soil sampling.	R	I	R	I	I		I
analyze fertilizers and amendments.	R	I	R	I	I		IRM
survey tillage and cropping.	R	I	R	I	I		I
evaluate soil conservation.	R	I	R	I	I		IRM
establish career development skills.	R	R	R	R	R		R

		AS/AAS						
		CERT B: Agronomy						
		CERT B: Agribusiness Specialist: Livestock (CERTA + 15 hrs. electives)						
		CERT A: Agribusiness						
AGRO 120 Special Topics in Crop Management		*Curriculum Mapping*						
	Program Outcomes	analyze the current events and issues that are occurring in agriculture.	examine the relationships between inputs and outputs in their agricultural field to make effective and profitable decisions.	explore aspects of agriculture used by scientists, marketers and producers.	apply existing and emerging knowledge and technologies.	apply management and marketing skills.	compare marketing and husbandry of several different animal species.	explain crop production concepts, range management and soil management.
Course SLO: Students will be able to								
classify management of crops.		R	I	I	R	I		I
contrast production aspect of crops.		R	I	I	R	I		I
distinguish technology in ag today.		R	I	I	R	I		I
identify strategic business planning.		R	I	I	R	I		I
review governmental impact.		R	I	I	R	I		I
classify environmental impact.		R	I	I	R	I		I
identify global agriculture.		R	I	I	R	I		I