AGRICULTURE / LIFE SCIENCE / NATURAL RESOURCES

SOME OCCUPATIONS RELATED TO INTEREST AND ABILITY IN AGRICULTURE

Diesel Mechanic

Farmer

Veterinarian

Plant Scientist

Air Pollution Specialist

U.S.D.A. Employee

Lab Animal Research Technician

Agronomist

Aquaculturalist

Animal Geneticist

Animal Nutritionist

Animal Geneticist

Game Warden

Marine Biologist

Floral Designer

Tree Surgeon

Forest Ranger

Landscaping Architect

Veterinarian Technician

Air Pollution Specialist

Soil Technician

Agricultural Engineer

Food Scientist

Fish & Game Manager

Agricultural Lawyer

Agricultural Journalist

Meats - Food Processor

Environmentalist

Agricultural Extension Employee

Agricultural Supply Technician

Fisheries Technician

Parks & Recreation Technician

Air Pollution Specialist

Agriculture Education Teacher

Soil Conservationist

Wildlife Technician

Agriculture Economist

Food Processing Technician

Agricultural Marketing Specialist

Agricultural Foreign Affairs Official

Agriscience

The FFA makes a positive difference in the lives of students by developing their potential for premier leadership, personal growth, and career success through Agricultural Education.

Agricultural Education prepares students for successful careers and a lifetime of informed choices in global agriculture, food, fiber, and natural resource systems.

Biotechnology Systems		Career Options	
Recommended Order of Courses	Science Equivalency	*Microbiologist*	*Cytologist*
1. Biotechnology	YES	*Biotechnologist*	*Doctor*
Genetically Modified Organisms	**Genomics**	*Geneticist*	*Nurse*
Medical Applications	**Tissue Culture**	*Oncologist*	*Biotech Lawyer*
Feeding our Growing World	**Science Ethics**	*Veterinarian*	*Animal Research*

Food Science and Processing Systems		Career Options	
Recommended Order of Courses	Science Equivalency	*Milk Inspector*	*Canning and Preserving Plant Supervisor*
1. Ag Products and Processing	YES	*Cheese Maker*	*Food Chemist*
Develop New Foods	**Smoke Meats**	*Viticulturist*	*Food Research and Development*
Experiment with Preservation	**Taste Testing**	*Food Inspector*	*Butcher*

Animal Systems		Career Options	
Recommended Order of Courses	Science Equivalency	*Animal Behaviorist*	*Veterinarian*
1. Animal Science	YES	*Professor of Animal Science*	*Geneticist*
2. Marine Biology/ Aquaculture	YES	*Livestock Evaluator*	*Ranch Manager*
3. Small Vet 1	NO	*Herdsman*	*Animal Care Specialist*
4. Small Vet 2	YES	*Cattle Buyer*	*Dairy Scientist*
5. Large Animal Vet	YES	*Fish Hatchery Manager*	*Livestock Breeder*

Plant Systems		Career Options	
Recommended Order of Courses	Science Equivalency	*Landscape Designer*	*Custom Chemical Applicator*
1. Floriculture/ Landscape Design	NO	*Florist*	*Crop Sales Representative*
2. Intro to Horticulture	YES	*Lawn Care Maintenance*	*Flower Grader*
3. Forestry	NO	*Forester*	*Tree Surgeon*
Plant Cloning	**Green Industry**	*Plant Science Professor*	*Turf Grower*
Aquaponics	**Crop/ Plant Research**	*Plant Breeder*	*Nursery Manager*

Power Structural and Systems		Career Options	
Recommended Order of Courses	Science Equivalency	*Welder*	*Tractor Dealer*
1. Ag Diesel Mechanics	NO	*Custom Operator*	*Irrigation Engineer*
2. Ag Mechanics and Construction	NO	*Feedlot Equipment Operator*	*Machinery research & Development*
3. Advanced Ag Diesel	NO	*Farm Equipment Mechanic*	*GPs Manufacturer*
Fix and Repair Engines	**Design and Build Systems**	*Agricultural Engineering Technician*	*Process Engineer*

Natural Resources & Environmental Service Systems		Career Options	
Recommended Order of Courses	Science Equivalency	*DNR Warden*	*Aquatic/ Marine Biologist*
1. Zoology/ Wildlife	YES	*Wildlife Manager*	*Commercial Fisherman*
2. Marine Biology/ Aquaculture	YES	*Forester/ forestry Technician*	*Fish and Game Biologist*
3. AP Environmental Science	YES	*Ecologist*	*Conversation Scientist*
4. Forestry	NO	*Forester*	*Tree Surgeon*
5. Outdoor Recreation	NO	*DNR Warden*	*Small Engine Tech*
Manage Wildlife	**Work Outside**	*Park Manager*	*Soil Extension Agent*
Positively Impact our World	**Raise Fish**	*Environmental Impact Evaluator*	*Hydrologist*

Agribusiness Systems		Career Options	
Recommended Order of Courses	Science Equivalency	*Farm Auctioneer*	*Agricultural Lawyer*
1. Agribusiness Management	NO	*Credit Analyst*	*Agricultural Economist*
Communications	**Marketing**	*Grain Merchandiser*	*Agricultural Publicist*

AGRICULTURE / LIFE SCIENCE / NATURAL RESOURCES

Course Length	Credit	Name of Course	Course Number	9	10	11	12	Prerequisite
1 Sem	.5	Biotechnology-ES	670B1B	_	#	X	X	Prerequisite: Biology Recommended: Chemistry, & 1 plant or animal science course
1 Sem	.5	Sm Animal Vet Sci 1	672B1A	X	X	X	X	See Description
1 Sem	.5	Sm Animal Vet Sci 2-ES	673B1B	X	X	X	X	Small Vet 1
1 Sem	.5	Animal Science 1-ES	674B1A	-	X	X	X	See Description
1 Sem	.5	Large Animal Vet Sci-ES	676B1A	_	X	X	X	See Description
1 Sem	.5	Ag Engineering & Diesel Mechanics	680B1C	X	X	X	X	
1 Year	1	Advanced Ag Engineering & Diesel Mechanics	681B1X	_	X	X	X	Ag Engineering & Diesel Mechanics
1 Sem	.5	Ag Mechanization & Construction	685B1B	#	X	X	X	
1 Sem	.5	Agribusiness Management	686B1A	#	X	X	X	
1 Sem	.5	Ag Products & Processing-ES	687B1C	X	X	X	X	
1 Sem	.5	Outdoor Recreation	689B1B	X	X	X	X	
1 Sem	.5	Floriculture / Landscape Design	690B1B	X	X	X	X	
1 Sem	.5	Horticulture	692B1B	_	X	X	X	
1 Sem	.5	Zoology & Wildlife Science-ES	695B1C	X	X	X	X	
1 Sem	.5	Marine Biology & Aquaculture-ES	696B1C	X	X	X	X	
1 Sem	.5	Forestry	698B1A	X	X	X	X	
1 Year	1	Advanced Placement Environmental Science-ES [idx]	345B1X	–	X	X	X	Math 1 and Biology

\# Denotes an exception to the standard course sequence. The course is open to students with the pre-approval of both the Counseling and Agriculture/ Life Science/ Natural Resource Departments. Please contact the PHS Counseling office with questions.

X Enrollment available to students in designated grade levels

[idx] This course is Grade Indexed

ES Denotes “Equivalent Science”—The Wisconsin Department of Instruction and the UW System has designated these courses as science equivalent courses. Most UW System campuses will count the completion of one or more approved science equivalent courses as the third unit of science as long as the student has taken some combination of biology/chemistry/physics for the other two units.

670B1B - BIOTECHNOLOGY: CONNECTION OF HUMANS, ANIMALS, & PLANTS-ES			
Semester Course	Grades 11-12 (#)	.5 Credit	Prerequisite: Biology Recommended: Chemistry, & 1 plant or animal science course
Explore genetic engineering, DNA fingerprinting, microbiology, immunology, animal/plant tissue culturing, transgenic animals/plants and cloning. Expose yourself to cutting edge biotechnology opportunities of the 21st century. This course will integrate science and agricultural concepts by allowing students to "learn by doing." The course will allow the student to earn science credit.			

672B1A - SMALL ANIMAL VETERINARIAN SCIENCE 1			
Semester Course	Grades 9-12	.5 Credit	Prerequisite: None
This class will explore units in veterinary sciences with emphasis on small domesticated pets. Much of the material can be applied to human medicine and is strongly recommended for students interested in the human medical field because of the hands-on approach to actually doing surgery on animals and working with the mammal system. Students will have an opportunity to apply practices used by veterinarians and animal scientists with dogs, cats, and laboratory animals. Units in reproductive physiology and anatomy, feeding practices, disease control, management practices, handling techniques and animal housing will be discussed. Field trips, labs, professional guest speakers, and actual surgeries will supplement the classroom instruction.			

673B1B - SMALL ANIMAL VETERINARIAN SCIENCE 2-ES			
Semester Course	Grades 9-12	.5 Credit	Prerequisite: Small Animal Vet Science 1
This course will expand on material covered in Small Animal Veterinarian Science I by advancing the students skills in veterinary science. The class will deal with small domesticated pets such as dogs, cats, lab animals, hamsters, guinea pigs, caged birds, fish/aquariums, rabbits, reptiles and exotic animals. The student will learn basic training and grooming principles for dogs and cats. The class will also deal with parasites that affect pets. Students will work as lab assistants doing DNA fingerprints, blood tests, urine tests, and animal tissue cultures on their pets. Students will gain work experience in the operation and management of a veterinary office. Students will also assume the role of a veterinarian and develop skills in dissection and advanced surgery techniques.			

674B1A - ANIMAL SCIENCE 1-ES *			
Semester Course	Grades 10-12	.5 Credit	Prerequisite: None
In this course, students will acquire skills to evaluate livestock and dairy animals and how to read and evaluate genetic pedigrees. Anatomy, judging techniques, and industry standards for cattle, hogs, sheep, poultry and dairy cattle will be discussed. A unit in meat evaluation and meat science will also be included. Students will complete food science labs which look at the various products that are produced in the animal industry. ***The course is transcribed with NWTC's Intro to Dairy Science (10-090-326).**			

676B1B - LARGE ANIMAL VETERINARIAN SCIENCE-ES			
Semester Course	Grades 10-12	.5 Credit	Prerequisite: None. Small Animal Veterinary Sciences 1 and 2 and Animal Science 1 are recommended
In this course, students will focus on the large animal veterinary sciences with specialization in horses, dairy, beef, swine, and sheep species. Emphasis will be placed upon knowledge and practices that veterinarians and animal scientists use daily with those animals. This is an excellent class for the student interested in the human medicine field because of the laboratory experiments done in class. Reproductive physiology, anatomy, food science, genetics, biotechnology, surgical procedures and techniques, nutrition, diseases, parasites, artificial insemination and management of large animals will be explored.			

680B1B - AG ENGINEERING & DIESEL MECHANICS			
Semester Course	Grades 9-12	.5 Credit	Prerequisite: None
This practical application class will focus on the repair and restoration of large, heavy-duty engine mechanics from an industry and ag engineering standpoint. Students will learn safe operation of equipment used for the large engine rebuilding process. You will also learn agricultural engineering practices, restoration body work, maintenance, adjustment, and repair of agricultural diesel engine systems. Emphasis will be on the engine overhaul procedures, including units on engine cooling, lubrication and powertrain systems. Technical Precision Measuring devices will be used on a regular basis to make sound management decisions on the engine overhaul process, and to complete essential preventive maintenance procedures necessary to keep these engines working at optimum efficiency. Shop instruction will include a group project on a massive diesel engine overhaul. The students will learn about each phase of the rebuilding process, starting with the basic design differences of various brands of engines, to cylinder head, fuel injection, bottom end, and the cylinder remanufacturing processes. The course will also start to develop a framework on how to restore and/or recondition agricultural equipment for future courses in either the Advanced Ag Engineering & Diesel Mechanics course or the Farm Mechanization and Construction course.			

681B1X - ADVANCED AG ENGINEERING & DIESEL MECHANICS			
Year Course	Grades 10-12	1 Credit	Prerequisite: Ag Engineering & Diesel Mechanics and access to a diesel engine

This advanced level course is designed for students pursuing a career in the diesel and agriculture mechanical field, and have already excelled in the Ag Engineering & Diesel Mechanics class the previous year. Students will develop, plan, implement and finance advanced level agricultural mechanical projects of their choice. Emphasis will be placed on advanced techniques in the engine overhaul process, with advanced skills being used in all phases of this elaborate and demanding technical field. Other competencies involve diagnosing electrical system malfunctions, cylinder head failures, fuel injector & injection pump maintenance, Standard, CV and Hydrostatic transmission maintenance along with complete powertrain analysis. Advanced engine diagnostic trouble shooting techniques, advanced diesel engine maintenance, specialized repair applications and advanced preventative maintenance procedures will be emphasized. Student projects should be well thought out in advance of the school year and should be ready to be brought in by the 1st week of October. Students also have the opportunity to compete in a national and state tractor restoration contest if they would like with the possibility of winning $5000. If a student does not have their own advanced project, they should contact community members and/or relatives the summer before to alert our community that a project is needed and to help set-up the project with you before the class starts.

685B1B - AG MECHANIZATION & CONSTRUCTION			
Semester Course	Grade 10-12 (#)	.5 Credit	Prerequisite: None

This shop-based class is designed to meet the needs of any students either presently working in agribusiness or who plan to someday manage an agribusiness. This class will focus its attention on training students to repair and maintain all of the equipment production agriculturalists use on a regular day-to-day basis. Hands-on learning in the shop will be used to repair, set-up and maintain farm tillage, planting, harvesting, granular and sprayer equipment. Special emphasis in TMR mixers, silo unloaders, skid steers, grain drying, barn wiring, basic welding and construction techniques for farm structures, concrete work, basic refrigeration, ag plumbing, land tiling, irrigation systems, agronomy techniques, hydraulics and troubleshooting milk parlor systems are topics that will be explored with real-life, hands-on applications. Guest speakers, field trips and various types of equipment will be brought into the shop for students to gain full knowledge of how all of these new technologies can be used efficiently and repaired effectively.

686B1A - AGRIBUSINESS MANAGEMENT*			
Semester Course	Grade 10-12 (#)	.5 Credit	Prerequisites: None

The Agribusiness Management course is designed for prospective Agribusiness managers and management consultants that will work in the commercial environment of modern agribusiness in the Midwest. Students will develop innovative and strategic methods for advancement in today's world of production agriculture. Topics that will be explored include livestock housing, agricultural construction, human resource management, production enterprises, budgeting, managing equipment, animal management decisions, crop scheduling, financial analysis and natural resource management.

***This course is transcribed with NWTC's Agribusiness Economics (10-090-303) when taken as a junior or senior.**

687B1A – AG PRODUCTS & PROCESSING-ES			
Semester Course	Grade 9-12	.5 Credit	Prerequisites: None

This course is designed to introduce students to the world of food preservation, food origins and how modern production practices affect our food quality in our ever-changing world. Students will be able to discover new food sources, ways to process, preserve, package or store food, food processing career opportunities, and inspecting food processing areas. Learning will focus on labs with modern processes and procedures in meat selection and cut identification, dairy processing, fruit and vegetable processing, and cereal grain processing. There will be activity-based experiences including meat ID and cutting, making of brats, cheese, and other food processing practices taking the product from the field to the store shelf. Food processing is the largest industry in the United States. As the industry tries to meet consumer demands, more highly knowledgeable and competently trained food technologists are needed. This course offers advanced exploration in a field where salaries are competitive and graduates with this knowledge are in demand.

689B1B - OUTDOOR RECREATION			
Semester Course	Grades 9–12	.5 Credit	Prerequisite: None

Outdoor Recreation will allow students the chance to learn principles of environmental education in relationship to hands-on stewardship of the land. Topics of class will include county, state, national and international environmental travel; the correct use of GPS units; and forest utilization strategies according to our school forest wise use plan. Students will be involved in numerous projects including ATV safety certification, snowmobile safety certification, boaters safety, trapper ed., and hunter safety. For anyone who enjoys spending time outdoors, this is the class for you! This course will also address FFA and Supervised Agricultural Experiences.

690B1B - FLORICULTURE/LANDSCAPE DESIGN			
Semester Course	Grades 9–12	.5 Credit	Prerequisite: None

This class is for those students who would like more detailed instruction and experience in the horticulture industry. Students will get hands-on experience in landscaping architecture using CAD computer programs and architectural drawings made by the students. Students will be constructing 3-D scale models of their preferred landscape. Students will learn principles of landscape design, floral design, boutonniere and corsage design, using silk and natural flowers, identification of common landscaping trees, shrubs, ground covers, and hardy perennials. Greenhouse gardening and greenhouse management will be explored within the greenhouse. Actual marketing and sales techniques will also be applied. Horticulture Co-op placement is possible following Horticulture, Floriculture/Landscaping and Advanced Greenhouse Management research design.

692B1B - HORTICULTURE			
Semester Course	Grades 10 – 12	.5 Credit	Prerequisite: None

This course is designed to learn about all areas of horticulture and greenhouse practices. Students will acquire skills in asexual and sexual propagation with hands-on experience of proper fertilizing practices, pest management techniques, greenhouse structures and engineering, caring for flower beds, lawns, shrubs, trees, fruits and vegetables, starting plants from seeds and cuttings and air layering from within the greenhouse. Students will learn to identify bedding and foliage plants, plant parts and functions with units on genetic cloning and "Wisconsin Fast Plants." Students will also have hands-on experience in landscaping practices, growing various greenhouse crops, such as Poinsettias, Chrysanthemums, bulb crops, pruning and caring of fruit trees, with extensive laboratory techniques in tissue micropropagation and research design. The Pulaski High Greenhouse will be our classroom.
Horticulture Co-op placement is possible following Horticulture and Advanced Greenhouse Management.

695B1A - ZOOLOGY & WILDLIFE SCIENCE-ES			
Semester Course	Grades 9–12	.5 Credit	Prerequisite: None

How many of our worlds' wildlife species are in danger of disappearing from our planet? What can we do to help these animals survive and flourish? This course will survey the animal kingdom and the diversity of animals on this planet as well as here in Wisconsin. This course takes an intensive look into individual animal species. Students will study animal classification, structure, and function. A variety of the world's habitats and species are examined. Contemporary issues such as endangered species, wildlife management and habitat degradation are explored.

696B1A - MARINE BIOLOGY & AQUACULTURE-ES *			
Semester Course	Grades 9–12	.5 Credit	Prerequisite: None

How does the pollution we make in our environment affect our marine and land ecosystems? What can we do to protect our worlds' oceans and their organisms? This course will give a scientific introduction to the study of marine organisms, their environment and the interactions that occur between them. Areas of exploration include coral reef communities, marine fish and mammals, properties of the oceans, estuaries, and other marine ecology. Students will understand the important relationships between marine life and freshwater systems. Additionally, the effects of man on the environment and new biotechnologies used to maintain a pristine earth will be examined.
***This course is transcribed with NWTC's Aquaculture and Aquaponics (10-090-115).**

698B1A - FORESTRY			
Semester Course	Grades 9–12	.5 Credit	Prerequisite: None

In Forestry, students will gain the necessary skills to start them on the lifelong process of becoming that knowledgeable woodsman and savvy preservationist. Students will focus their experience on the native forest species that inhabit Wisconsin. Units of study include ecology, habitat management, wildland fires, urban forestry and Tree ID. Wisconsin forest land will help students embark on tree identification, tree structure and growth, forest ecosystem management, silviculture, and timber production. Learning enrichment opportunities include developing forest management plans, and maintenance of the school forest. This course will also address FFA and Supervised Agricultural Experiences.

345B1X - ADVANCED PLACEMENT ENVIRONMENTAL SCIENCE-ES Grade Indexed (see pg 16)			
Year Course	Grades 10–12	1 Credit	Prerequisite: Math 1 and Biology
AP Environmental Science provides an investigative approach to the interrelationships of the natural world through the study of the fundamental concepts, principles, and methodologies of environmental science, with an emphasis on inquiry and critical thinking skills including problem solving and experimental investigations. Topics of study include Earth systems and resources, ecosystems and energy flow, population biology, land and water use, energy resources and consumption, pollution, agriculture conservation and global change. Laboratory work and field studies are an integral component of this course. Students will be required to take the Advanced Placement test.			