FIRE SCIENCES (FIRE)

FIRE 1101 Career in Fire and Fuels (2 credits)
Course introduces students to a spectrum of career paths related to wildland fire and fuels. Students will meet with professionals from a variety of employers and career levels and receive support for developing job applications and building the confidence needed to pursue meaningful work in the field of wildland fire and fuels. Typically Offered: Fall.

FIRE 1130 Introduction to Wildland Fire Management (2 credits)
Online course introduces students to wildland fire management and the foundational skills required for entry-level Firefighter Type 2, aligning with the National Wildfire Coordinating Group's (NWCG) basic fire training series (S-130, S-190, L-180). Students who have previously completed NWCG basic fire training series can submit documentation of completion; students who have not completed NWCG basic fire training series will be expected to complete it as part of the course. Students complete readings and reflective exercises designed to build an attitude of continual learning in wildland fire management. Students pursuing the B. S. in Fire Ecology and Management should take FIRE 1144 instead. Typically Offered: Fall and Spring.

FIRE 1144 Wildland Fire Management (3 credits)
Course introduces students to wildland fire management and delivers the required National Wildfire Coordinating Group's (NWCG) training for individuals new to wildland fire management seeking certification as Firefighter Type 2 (S-130, S-190, L-180), as well as for those with experience aiming to advance to Firefighter Type 1 (S-290, S-131). Students work in squads to complete practical exercises supported by comprehensive lessons on the fire environment, fire management, and human factors. Students engage in regular reflections on readings and activities to build the habit of being a student of fire. Typically Offered: Spring.

FIRE 1212 Saws and Pumps (1 credit)
Course addresses basic operation of chainsaws for use on the fireline and wildland fire pumps and includes reflections and creation of job aids related to saws and pump operations. Students must have completed or been accepted into an offering of NWCGs S-211 (Portable Pumps and Water Use) and S-212 (Wildland Fire Chainsaw). Typically Offered: Spring and Summer.
Prereqs: Instructor permission

FIRE 2000 (s) Seminar (1-16 credits, max 99)
Credit arranged.

FIRE 2030 (s) Workshop (1-16 credits, max 99)
Credit arranged.

FIRE 2040 (s) Special Topics (1-16 credits, max 99)
Credit arranged.

FIRE 2213 Vegetation Management (2 credits)
General Education: Capstone Experience
Vegetation management is the key to effective wildland fire management. In this course, students are introduced to various methods for managing vegetation including prescribed fire, wildfire, thinning, mastication, and herbicide. Students use case studies to understand when and how to apply these treatments and how these treatments can influence fire behavior and fire effects. Upon successful completion of this course, students may be eligible for National Wildland Coordinating Group (NWCG) credit for S-219 (Fire Operations). Typically Offered: Spring and Summer.
Prereqs: FIRE 2310 and FIRE 2244

FIRE 2215 Wildland-Urban Interface Assessment and Communication (2 credits)
As the wildland-urban interface grows, so does the need to prepare structures for the inevitability of wildfire. Students perform structure evaluations and make recommendations on how to increase the defensibility of homes and property. Students explore strategies for communicating about prescribed fire, wildfire, and defensible space with the public. Upon successful completion of this course, students may be eligible for National Wildland Coordinating Group (NWCG) credit for S-215 (Fire Operations in the Wildland Urban Interface). Typically Offered: Fall.

FIRE 2244 Introduction to Fuels Inventory and Monitoring (2 credits)
Course helps students learn about the role of monitoring in fire and land management. Students practice monitoring and reporting using photo points, journaling, and fuels sampling to gather information on changes over time, fuel loading, vegetation characteristics, fire behavior, and fire effects. Course leads to real-world expertise, whether one is becoming a more effective land manager or simply understanding fire's impact on the environment. Typically Offered: Fall.

FIRE 2256 Science Synthesis in Fire Ecology and Management (2 credits)
Course prepares students to read and discuss current scientific and professional publications related to wildland fire and fuels management. Typically Offered: Fall.

FIRE 2261 Field Navigation and Fire Technology (2 credits)
Course provides students with immersive field experience to master navigation with compass, map, and cutting-edge mobile applications such as Avenza and Fieldmaps. Students also become familiar with fire behavior modeling programs such as BehavePlus and IFTDSS, and collect the necessary information to inform incident command decisions on prescribed fire and wildfire. Upon successful completion of this course, students may be eligible for National Wildland Coordinating Group (NWCG) credit for S-244 (field observer). Typically Offered: Spring.
Prereqs or
Coreqs: FIRE 2244

FIRE 2273 Medical Response and Stress Management in Natural Resources (2 credits)
In the dynamic field of natural resources and fire management, professionals often face high-stress situations that demand both immediate medical response and effective stress management. Recommended preparation includes Wilderness First Aid or Wilderness First Responder where students develop experience with practical techniques for medical response, including first aid, emergency care, and crisis intervention tailored to the unique conditions of natural resource settings. Students will also complete training on stress-first aid and discuss the mental health challenges related to working in natural resources and fire management. Typically Offered: Fall.
Prereqs: Instructor permission

FIRE 2280 Leadership and Decision-Making in Fire Management (2 credits)
Course explores strategies to assist with leadership and decision-making. Students must have completed or be accepted into an offering of the National Wildland Coordinating Group (NWCG) L-280 (Followership to Leadership). Students complete the NWCG Wildland Fire Leadership Development Program through readings, reflections, and discussions to help identify the core principles of leadership in wildland fire. Students also develop strategies to enhance their abilities as both leaders and followers. Recommended preparation: NWCG's S-131 (Firefighter Type 1). Typically Offered: Spring.
Prereqs: Instructor Permission

FIRE 2284 Fire Policy and Administration (2 credits)
Synthesis of historic and current fire policy and how it is implemented across agencies. Typically Offered: Spring.

FIRE 2290 Anticipating Wildland Fire Behavior (2 credits)
Course prepares students to build and practice the ability to anticipate wildland fire behavior through a greater understanding of how fuels, weather, and topography influence wildland fire behavior. Students also explore the details of notable incidents where fire led to unintended human tragedy and discuss ways that firefighters can maintain safety and effectiveness through situational awareness. Upon successful completion of this course, students may be eligible for National Wildland Coordinating Group (NWCG) credit for S-290 (Anticipating Wildland Fire Behavior). Typically Offered: Spring.

FIRE 2310 Introduction to Fire Effects and Management (2 credits)
Course addresses the impacts of fire on diverse ecosystems, from soils and aquatic environments to cultural resources, flora, fauna, plant diseases, and invertebrates. Introduction to how adaptive management can be used to manage complex systems. Course offers a comprehensive overview of fire effects and introduces the principles of adaptive management for navigating complex systems. Upon successful completion of this course, students may be eligible for National Wildland Coordinating Group (NWCG) credit for RX-310 (Introduction to Fire Effects). Students interested in upper division credits should take FIRE 4100 instead. Typically Offered: Fall.

FIRE 2980 Wildland Fuels and Fire Internship (1 credit, max 2)
Operating as a practitioner of wildland fire is essential to building confidence and capability. Students must be employed at an approved facility or organization in wildland fuels or fire management that offers varied occupational experiences, such as wildland firefighting, fuels reduction, and fuels measurements. Typically Offered: Summer.

FIRE 2990 (s) Directed Study (1-16 credits, max 99)
Credit arranged.

FIRE 3321 Cultural Use of Fire (3 credits)
General Education: American Experience
Fire is an integral part of the natural world, largely because of the use of fire by native cultures. This course will explore the methods and purposes of using fire and the mindsets influencing the use of fire. Students will complete reading and reflection assignments and will consider their own relationship with fire and the natural environment. Typically Offered: Spring. Cooperative: open to WSU degree-seeking students.

FIRE 3323 Communication and Facilitative Instruction in Fire Management (2 credits)
Course provides students with skills that support effective communication, instruction, and mentoring and the impact it has on a fire management career. Students explore essential theories and participate in virtual hands-on activities that sharpen their communication and instruction abilities. This course equips students with the tools to become more successful instructors of fire. Upon successful completion of this course, students may be eligible for National Wildland Coordinating Group (NWCG) credit for M-410 (Facilitative Instructor) with the option of getting a mentoring memo of completion. Typically Offered: Fall.

FIRE 3326 Fire Ecology (3 credits)
The global study of wildfire as a biophysical and ecological process, including controls of wildfires, ecological effects of wildfires, fire history, and fire in the context of global environmental change. Evolutionary plant adaptations to fire and mechanistic impacts of fire on organisms. Current issues in fire science in the Western US and globally, including readings and discussions of recent scientific literature. Typically Offered: Fall.
Prereqs: FOR 2100 or WLF 2200

FIRE 4000 (s) Seminar (1-16 credits, max 99)
Credit arranged.

FIRE 4030 (s) Workshop (1-16 credits, max 99)
Credit arranged.

FIRE 4040 (s) Special Topics (1-16 credits, max 99)
Credit arranged.

FIRE 4050 (s) Professional Development (1-16 credits, max 99)
Credit arranged.
Prereqs: Permission

FIRE 4100 Fire Effects and Management (3 credits)
Course discusses the direct and indirect effects of fire on humans, soils, water, plants, and animals and how adaptive management can be used to plan for and mitigate fire effects. Students complete a literature review on fire effects in an area of their choice, and they experience fire effects firsthand in the field. Upon successful completion of this course, students may be eligible for National Wildland Coordinating Group (NWCG) credit for RX-310 (Introduction to Fire Effects). Recommended preparation: FOR 2100 or WLF 2200. Typically Offered: Varies.

FIRE 4310 Prescribed Burning Lab (3 credits)
General Education: Capstone Experience
Planning, conducting, and evaluating prescribed burns designed to accomplish natural resource management objectives. Sampling, models, and analysis used in writing required fire use plan. Five days of field trips; some on Saturdays. Typically Offered: Fall.
Prereqs: FIRE 1144 and Senior standing; and Permission Prereqs or
Coreqs: FIRE 3326

FIRE 4407 GIS Application in Fire Ecology and Management (3 credits)
Course provides students with independent skills using ArcGIS and ArcGIS Online while exposing them to different applications for GIS in fire ecology management. Skills developed include collecting data from the field, creating electronic and printable maps, working with rasters, and keeping data organized. Typically Offered: Spring.
Prereqs: FOR 3700 or GEOG 3850

FIRE 4410 Air Quality, Pollution, and Smoke (3 credits)
Cross-listed with GEOL 4410
Joint-listed with FIRE 5410
Provides details of the controls and drivers of emission processes and impacts on air quality from fires, industry, and natural sources. The course provides an overview of relevant policy and health impacts of various air pollutants on humans. It also includes detail on atmospheric chemistry and physics related to natural and anthropogenic emissions and how these impact atmospheric chemistry and climate. Overview of the combustion and emission process, how these emissions impact air quality, and what models exist to monitor these emissions. Other topics to include guidelines for smoke management planning, attainment issues, atmospheric transport, and deposition processes. Additional work required for graduate credit. Typically Offered: Spring and Summer.

FIRE 4433 Fire and Fuel Modeling (3 credits)
Course prepares students to operate and evaluate contemporary spatial and non-spatial fire and fuel modeling systems and tools (e. g. , FireFamilyPlus, Fire Behavior Fuel Models, BehavePlus, LANDFIRE, FlamMap, and IFTDSS). Students perform a landscape-scale fire and fuels assessment for an area of their choice and evaluate the modeling results for management applications on fuel treatment effectiveness or potential fire behavior impacts. Typically Offered: Varies.
Prereqs: FOR 3700, GEOG 3850, or Permission

FIRE 4435 Remote Sensing of Fire (3 credits)
Joint-listed with FIRE 5435
The course describes the state of the art algorithms and methods used for mapping and characterizing fire from satellite observations. The course will link the physical aspects of fire on the ground with the quantities that can be observed from remote sensing, and present an overview of the different aspects of environmental fire monitoring. The course will be accompanied by weekly lab sessions focused on the processing of satellite data from sensors used operationally for fire monitoring. This course assumes that students are familiar with the fundamental concepts of mathematics and physics, understand basic remote sensing techniques, and can use maps and GIS data layers. For graduate credit, additional literature review and a class project including evaluation of new, advanced technologies is required. Typically Offered: Spring.
Prereqs: FOR 3700 or Permission

FIRE 4440 Prescribed Fire for Ecologically-Based Management (2-3 credits)
Course prepares students to better understand prescribed burning in support of ecologically based management through reading, discussing, participating, monitoring, and reflecting on prescribed burns. Students will participate in service-learning opportunities with training exchanges, prescribed fire training centers, and/or local prescribed burns. Additional credits are earned by completing a synthesis of prescribed fire history and effects in a chosen management area with the purpose of advancing the use of prescribed fire in that management area. Typically Offered: Spring and Summer.
Prereqs: Instructor Permission

FIRE 4451 Fuels Inventory and Monitoring (3 credits)
Monitoring is a critical step in confirming that management objectives are met and communicating the effectiveness of management actions. Students develop the skills needed for fuels monitoring and fuels management decisions. These skills are developed through the synthesis of relevant scientific literature, class discussions, implementation of fuel inventory protocols, and hands-on experience with several fuel and fire modeling software programs. For the final project, students design and implement a monitoring protocol for an area of their choice. Typically Offered: Spring.

FIRE 4490 Fire Behavior (2 credits)
Understand the physical and chemical processes controlling combustion and fire behavior. Gain in-depth knowledge of commonly-used, point-scale fire behavior models and tools, including key assumptions and limitations. Critically review and discuss scientific literature, current topics, and case studies. Lab sessions include designing and undertaking small-scale fire behavior experiments, developing simple quantitative models, and a field trip. Typically Offered: Varies.
Prereqs: FIRE 3326; and PHYS 1000/PHYS 1000L or PHYS 1111/PHYS 1111L

FIRE 4980 (s) Internship (1-16 credits, max 99)
Credit arranged. Cooperative: open to WSU degree-seeking students.

FIRE 4990 (s) Directed Study (1-16 credits, max 99)
Credit arranged.

FIRE 5000 Master's Research and Thesis (1-16 credits, max 99)
Credit arranged.

FIRE 5010 (s) Seminar (1-16 credits, max 99)
Credit arranged. Graded Pass/Fail.

FIRE 5020 (s) Directed Study (1-16 credits, max 99)
Credit arranged.

FIRE 5030 (s) Workshop (1-16 credits, max 99)
Credit arranged.

FIRE 5040 (s) Special Topics (1-16 credits, max 99)
Credit arranged.

FIRE 5050 (s) Professional Development (1-16 credits, max 99)
Credit arranged.

FIRE 5100 GIS Application in Fire Ecology and Management (3 credits)
Joint-listed with FIRE 4407
Course provides students with independent skills using ArcGIS and ArcGIS Online while exposing them to different applications for GIS in fire ecology management. Skills developed include collecting data from the field, creating electronic and printable maps, working with rasters, and keeping data organized. Typically Offered: Spring.

FIRE 5326 Fire Ecology (3 credits)
Fire-related ecology of plant and animal species in wildlands; effects of fire occurrence and suppression on physical environment, landscapes, and processes in both natural and managed ecosystems. Typically Offered: Fall and Summer.
Prereqs: General ecology course

FIRE 5410 Air Quality, Pollution, and Smoke (3 credits)
Joint-listed with FIRE 4410, GEOL 4410
Provides details of the controls and drivers of emission processes and impacts on air quality from fires, industry, and natural sources. The course provides an overview of relevant policy and health impacts of various air pollutants on humans. It also includes detail on atmospheric chemistry and physics related to natural and anthropogenic emissions and how these impact atmospheric chemistry and climate. Overview of the combustion and emission process, how these emissions impact air quality, and what models exist to monitor these emissions. Other topics to include guidelines for smoke management planning, attainment issues, atmospheric transport, and deposition processes. Additional work required for graduate credit. Typically Offered: Spring and Summer.

FIRE 5435 Remote Sensing of Fire (3 credits)
Joint-listed with FIRE 4435
The course describes the state of the art algorithms and methods used for mapping and characterizing fire from satellite observations. The course will link the physical aspects of fire on the ground with the quantities that can be observed from remote sensing, and present an overview of the different aspects of environmental fire monitoring. The course will be accompanied by weekly lab sessions focused on the processing of satellite data from sensors used operationally for fire monitoring. This course assumes that students are familiar with the fundamental concepts of mathematics and physics, understand basic remote sensing techniques, and can use maps and GIS data layers. For graduate credit, additional literature review and a class project including evaluation of new, advanced technologies is required. Typically Offered: Spring.

FIRE 5484 Wildland Fire Policy (2 credits)
This course is an online course only. Relationships between fire science and management and the federal laws and regulations that affect fire management in wildland ecosystems; the politics of wildland fire; and the effects of wildland fire on wildland-urban interface (WUI) communities. Recommended preparation is an upper division course in natural resource, environmental policy, or FOR 5300. Typically Offered: Fall.

FIRE 5490 Advanced Fire Behavior (3 credits)
Credit may be earned in only one of the following: FIRE 4490 or FIRE 5490. This course is an online course only. Understand the processes that control fire behavior in forest and rangelands, including combustion, emissions and heat release, and related fire effects. Use theory and advanced knowledge with scientific literature and case studies to critically assess the assumptions and limitations of limitations of surface and crown fire models, including the varying influences of fuels, terrain, and environmental conditions.

FIRE 5970 (s) Practicum (1-16 credits, max 99)
Credit arranged.

FIRE 5980 (s) Internship (1-16 credits, max 99)
Credit arranged.

FIRE 5990 Non-thesis Master's Research (1-16 credits, max 99)
Credit arranged. Research not directly related to a thesis or dissertation.
Prereqs: Permission

FIRE 6000 Doctoral Research and Dissertation (1-45 credits, max 99)
Credit arranged.

FIRE 6010 (s) Seminar (1-16 credits, max 99)
Credit arranged.

FIRE 6980 Internship (1-16 credits, max 99)
Credit arranged.