SUSTAINABLE TRAILS DEVELOPMENT GRADUATE CERTIFICATE

Information

https://davisonline.wvu.edu/academics/graduate-certificates/sustainable-trails-development
https://online.wvu.edu/programs/sustainable-trails-development-graduate-certificate/

Requirements

- Six required courses: 18 credits, all offered online; all run for 8-weeks (except RESM 440)
- Minimum grade of C- required in all coursework for completion of certificate

Course Descriptions

RESM 440: Foundations of Applied GIS (online: fall or summer, in person: spring)
The goal of this course is to introduce Geographic Information Systems (GIS) and build foundations in its use to allow students to solve spatial problems. Specifically, the course will teach students necessary spatial and quantitative analysis methods to solve problems in many interdisciplinary applications. Online, 3 credits.

LARC 532: Recreation, Trails, and Community Development (late Fall)
Using outdoor recreation as a facilitator of community development, this course will provide a preview of comprehensive trail planning strategies guiding sustainable trail development, including the benefits of trails (economic, health, and social), strategies for stakeholder engagement, funding, activation and programming, and evaluation. Online, 3-credit graduate course, cross listed with LARC 332 (for undergraduate students).

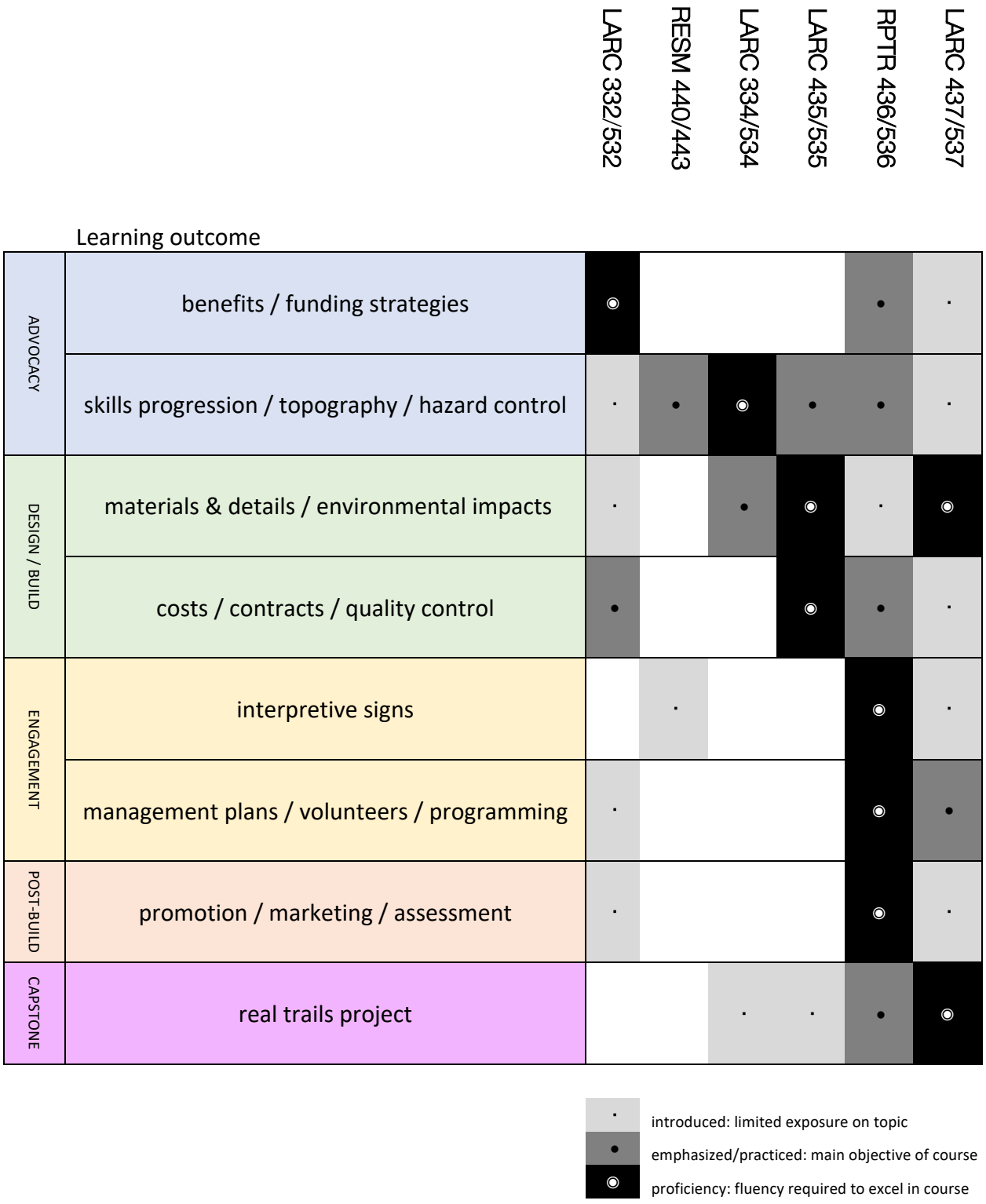
LARC 534: Sustainable Trails: Design Concepts (early Fall)
Plan trail networks according to current best practices, responding to site topography and aesthetics while incorporating skills progression and accessibility for trail users of all skill levels. Online, 3-credit graduate course, cross listed with LARC 334 (for undergraduate students).

LARC 535: Sustainable Trails: Design Detailing & Drainage (early Spring)
Refine trail masterplans for costing, bidding and construction documentation with site-specific detailing and specifications, while incorporating stormwater management best practices and ecological restoration principles. Online, 3-credit graduate course, cross listed with LARC 335 (for undergraduate students).
Catalog perquisites: LARC 534 or (LARC 231 and LARC 331 and LARC 360) with a minimum grade of C- in all.

RPTR 536: Sustainable Trails: Engagement (late Spring)
Develop management plans, incorporate interpretive signage, and activate greenspace and public trails with civic engagement while planning for post-construction maintenance. Online, 3 credit hours, cross listed with RPTR 436 (for undergraduate students).

LARC 537: Sustainable Trails: Practicum Experience
Engage directly in a trail project's design, construction, maintenance and/or monitoring, through a service-learning capstone project in sustainable trails development. Work with stakeholders and community representatives directly to support recreation economy development. Can be repeated for credit: students can enroll for 1, 2, or 3 credits at once. Online, graduate course, cross listed with LARC 437 (for undergraduate students).
Catalog pre-requisites: LARC 535 and RPTR 536 with a minimum grade of C-.

Curriculum Map



RESM 440:
FOUNDATIONS OF APPLIED GIS

Offered online in Fall (16 weeks) or Summer (10 weeks), or in person in Spring (16 weeks).

Register for both lecture and lab, i.e.,
RESM 440 Section 701 CRN# 85658 or Section 702 CRN# 84913,
plus RESM 440L Section 701 CRN# 89533 or Section 702 CRN# 83822

Primary Instructor: Jacquelyn Strager, email: jmstrager@mail.wvu.edu
Office hours: Tuesdays 10:00-11:00am, Thursdays 12:30-1:30pm

Course Goal and Description

The goal of this course is to introduce Geographic Information Systems (GIS) and build foundations in its use to allow students to solve spatial problems. Specifically, the course will teach students necessary spatial and quantitative analysis methods to solve problems in many interdisciplinary applications. The course will focus on the elements and capabilities of a GIS by emphasizing acquisition, management manipulation, and analysis of data for the solution of spatial problems. This course is designed to build students' confidence and familiarity with GIS technology through timely and appropriate local applications and datasets for West Virginia and beyond.

Expected Learning Outcomes

On successful completion of this course, students will…

1. Understand why location matters and how spatial data and analysis methods can be useful to solve problems with a spatial component.

2. Have ability to describe the components, functions, and applications of GIS. Be familiar with various spatial data formats, data sources, data source limitations, and methods for acquiring and/or creating spatial data.

3. Gain familiarity in using GIS software to produce mapped and tabular output, have ability to independently perform both vector and raster spatial analysis.

4. Use GIS to provide insights into spatial problems and present results using quality cartographic output.

LARC 532:
RECREATION, TRAILS, & COMMUNITY DEVELOPMENT

3 credits. Offered second half of Fall semester.

Instructors: Danny Twilley, Ph.D. / 410-708-7254 (Cell) / Email: danny.twilley@mail.wvu.edu
Rich Edwards / 540-421-6067 (Cell) / Email: □ichard.edwards@mail.wvu.edu

Course Description

Using outdoor recreation as a facilitator of community development, this course will provide a preview of comprehensive trail planning strategies guiding sustainable trail development, including the benefits of trails (economic, health, and social), strategies for stakeholder engagement, funding, activation and programming, and evaluation. Online, 3-credit undergraduate course, cross listed with LARC 532 (for graduate students).

Learning Resources

Several types of materials will be used to facilitate learning. The course will utilize online articles, reports, podcasts, videos, journals, popular media, etc.

Learning Outcomes

1. Summarize the benefits (economic, public health, social) of investing in trail development.

2. Describe the components and steps involved in the trail development process, from conception to activation and evaluation.

3. Explain funding strategies for trail development and key components of a request for proposals.

4. Discuss and summarize best practices and strategies for facilitating meaningful stakeholder engagement.

5. Explain regulatory and legal considerations commonly affecting trails, including risk management.

6. Articulate the importance of programming and activating trail systems, and describe the role evaluation plays in the development, implementation, and success in trail development.

LARC 534:
SUSTAINABLE TRAILS: DESIGN CONCEPTS

3 credits. Offered first 8 weeks of Fall semester.

Instructor: Vaike Haas, vaike.haas@mail.wvu.edu (304-293-5661)

Course Description

Plan trail networks according to current best practices, responding to site topography and aesthetics while incorporating skills progression and accessibility for trail users of all skill levels. Online, 3-credit graduate course, cross listed with LARC 334 (for undergraduate students).

Learning Outcomes

1) Respond to site topography by applying trail planning best practices, specifically: the half rule, 10% rule, 5% outslope and specify appropriate turns by hillslope/trail type.

2) Apply aesthetic design principles (control points, rhythm, harmony, anchors, edges, gateways) to trail design.

3) Plan trail networks for skills progression, with experience zones, stacked loops, and smooth transitions / flow, and technical trail features (TTFs) to enhance experience and appropriately manage visitor speed.

4) Apply AASHTO's multi-user trail design standards to designing trail crossings at roads (both surface intersections and tunnels).

5) Plan accessible trailheads according to Americans with Disabilities Act (ADA) design standards.

6) Respond with appropriate design standards to accommodate adaptive mountain biking (aMTB) for cyclists with disabilities, or when trail management calls for multi-modal use (micro-mobility, equestrian, e-bike, motorbike, ATV).

7) Synthesize understanding of course concepts by proposing a conceptual trail masterplan for an urban bike park.

LARC 535:
SUSTAINABLE TRAILS: DESIGN DETAILING & DRAINAGE

3 credits. Offered first half of Spring semester. Prerequisite: LARC 534 with a minimum grade of C-

Instructor: Vaike Haas, vaike.haas@mail.wvu.edu (304-293-5661)

Course Description

Refine trail masterplans for costing, bidding and construction documentation with site-specific detailing and specifications, while incorporating stormwater management best practices and ecological restoration principles. Online, 3-credit graduate course, cross listed with LARC 335 (for undergraduate students).

Learning Outcomes

1) Describe fundamental landscape ecology best practices for sustainable trail corridor selection.

2) Plan for stormwater flow, tread compaction and displacement: incorporate frequent grade reversals in trail designs to minimize tread watersheds and reduce soil erosion.

3) Design appropriate water/floodplain crossings (wetlands, bridges, fords) to minimize environmental impacts and reflect regulatory requirements, using the Rational Method to size bridges and culverts.

4) Create construction documentation, including details for retaining walls, bridges, boardwalks, and other stone/timber-built trail structures. Apply principles of a cohesive materials palette to construction details.

5) Analyze effectively written contract agreements and identify measures for quality control at multiple stages during construction (contractor selection, construction management, final inspection of built work).

6) Estimate construction costs related to trail construction.

7) Plan and detail an ecologically sensitive riparian corridor greenway.

RPTR 536:
SUSTAINABLE TRAILS: ENGAGEMENT

3 credits, offered second half of Spring semester

Course instructors:

Dr. David A. Smaldone, David.Smaldone@mail.wvu.edu
Recreation, Parks, and Tourism Resources

Dr. Chad D. Pierskalla Chad.Pierskalla@mail.wvu.edu
Recreation, Parks, and Tourism Resources

Richard J. Wolff, rjw0009@mix.wvu.edu
Design and Community Development

Course Description

Develop management plans, incorporate interpretive signage, and activate greenspace and public trails with civic engagement while planning for post-construction maintenance. Online, 3 credit hours, cross listed with RPTR 436 (for undergraduate students).

Learning Outcomes

1) Identify key components of an effective management plan for a trail system.

2) Design informative and effective interpretive signs for greenspace.

3) Know the maintenance that will be regularly required for upkeep, after the initial trail construction.

4) Outline effective strategies for volunteer management in trail maintenance, including appropriate tools and safety measures.

5) Develop strategies for programming new public greenspace, through special event planning and civic engagement.

6) Strategize for post-build promotion and marketing, and ongoing fundraising.

7) Consider post-build research / assessment.

LARC 537:
SUSTAINABLE TRAILS: PRACTICUM EXPERIENCE

1 to 3 credits. Offered Spring/Fall (online only, 1-3 cr) and Summer (in person, WV-based, 3 cr)
Prerequisites: Previous completion or concomitant enrollment in LARC 535 and RPTR 536

Instructors: TBD

Course Description

Engage directly in a trail project's design, construction, maintenance and/or monitoring, through a service-learning capstone project in sustainable trails development. Work with stakeholders and community representatives directly to support recreation economy development. Can be repeated for credit: students can enroll for 1, 2, or 3 credits at once. Online, graduate course, cross listed with LARC 437 (for undergraduate students).

Learning Outcomes

1) Apply principles of sustainable trail design / development to a real project, whether that project is at the stage of a) stakeholder engagement and master planning), b) construction (boots-on-the-ground implementation), or c) post-build (activation, maintenance, or monitoring).

2) Engage with experts in community development through outdoor recreation and purpose-built mountain bike (MTB) trails, whether in planning, design, construction, or maintenance; demonstrate understanding of potential benefits of outdoor recreation for communities.

3) Engage community representatives and stakeholders in the planning/implementation/activation of diverse recreational trail experiences. Outline the benefits for outdoor recreation gateway communities of partnering with federal and state agencies to develop and support recreation economies. Help communities generate support for developing recreation economies and expanding trail systems.

4) Compare guidelines set forth by the International Mountain Bicycling Association (IMBA) for the Ride Center designation process (trail difficulty and type: single-track, purpose built, gravity, etc.) with the US Forest Service standards for hiking, mountain biking, and equestrian trails.

5) Synthesize principles of sustainable trail design/development and apply to a real project.

6) Gain an understanding of career opportunities in trail planning, design, construction and maintenance with public and private agencies.

7) The above learning outcomes are shared with the cross listed undergraduate course LARC 437. In addition, grad students in LARC 537 will further develop plan details for the project location at each stage of the design process.