

River Studies and Leadership Certificate

Accepted Courses Matrix

Core Courses

Geographic Information Systems Core Courses (choose ONE):

CMU	Prescott College	SNC	U of U	WWU	MSU	VCU	NAU	UTC
GEOL 332/332L - Intro to GIS (3 cr)	ENV21400 - Intro to GIS (4 cr)	ENVS 421/ENVS 425 Graphic Information Systems and lab (4 cr)	GEOG 3140 Introduction to GIS (4 cr)	ENVS 320 Introduction to Geographic Information Science (4 cr)	GEOG 373 - Intro to GIS (4 cr)	ENVS 2XX. Basics of GIS	GSP 239 - Introduction To Geographic Information Systems (4 cr)	GEOL 2100 - Proposed Introductory GIS and Remote Sensing course (3 cr)
	ENV44720 - Environmental Problem Solving: A Spatial Approach (4 cr)		GEOG 3110 The Earth from Space – Remote Sensing of the Environment (3 cr)			URSP 360. Community and Regional Analysis and GIS (3 credits)	GSP 331/531 - GIS Foundations I: Map Design and GIS (4 cr)	ESC 4660 - Geographic Information Systems (3 cr)
			GEOG 5140 – Methods in GIS (4 cr)			ENVS 491 ENV DATA VISUAL (entry level GIS)	GSP 433/533 – Foundations II: Spatial Analysis and GIS Applications (4 cr)	
						ENVS 521. Introduction to Geographic Information Systems (3 credits)	GSP 435/535 - Programming For GIS (4 cr)	
						ENVS 654 - Environmental Remote Sensing (3 credits)	GSP 436/536 - Enterprise Geodatabases (4 cr)	
						URSP 625. Spatial Database Management and GIS Modeling. (3 credits)	GSP 437/537 - GIS Modeling and Analysis I: Raster (4 cr)	
							GSP 438/538 - GIS Modeling and Analysis II: Vector (4 cr)	
							GSP 320 - Introduction to Remote Sensing (3 cr)	
							GSP 529- Applied Remote Sensing (3 cr)	
							PRM 530- Intro to Geographic Information Systems (3 cr)	

River Science (choose ONE):

CMU	Prescott College	SNC	U of U	WWU	MSU	VCU	NAU	UTC
GEOL 455/455L - River Dynamics (4 cr)	ENV40000 - River Ecology & Conservation (4 cr)	ESCI 301/305 Hydrology and Water Resources with lab	BIOL 3045: Landscape Ecology (3 cr)	ESCI 410 Habitat and Ecology of Pacific Salmon and Trout (3 cr)	BIOL 402 (4) Stream Ecology	ENVS 201. Earth Systems Science	GSP 259 - Principles Of Geomorphology (3 cr)	ESC 4520 - Limnology and Reservoir Ecology (4 cr)
ENVS 433 - Restoration of Aquatic Systems (3 cr)	ENV 42XX – Hydrology (4 cr)		BIOL 3480/5430: Biography of and Urban Stream (3 cr)	ESCI 429 Stream Ecology (5 cr)	BIOL 405 (3) Fisheries Biology	BIOL 335. Global Change Biology (3 credits)	GLG 259/ L – Geomorphology (1 cr)	GEOL 4450 - Hydrology (3 cr)
	ENV42724 - Restoration Ecology: Watersheds of the Southwest (4 cr)		CVEEN 4410: Engineering Hydrology (3 cr)			BIOZ 491. River rock pool ecology	FOR 565 - Watershed Restoration (3 cr)	
	ENV42750 - Wetland Ecology & Management (4 cr)		CVEEN 5610/6610: Water Chemistry and Laboratory Analysis (3 cr)			BIOL 430. Invasion Biology (3 credits)	ENV 440/L/ or 540/L - Conservation Biology/Lab (4 cr)	
	ENV44754 – Topics in Geomorphology (4 cr)		GEO 3300: The Water Planet (3 cr)			BIOL XXX/ENVS XXX Enviro-techniques 1	BIO 477 - Fish Management (3 CR)	

**River Studies and Leadership Certificate
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						BIOL XXX/ENVS XXX Enviro-techniques 2	FOR 563 - Watershed Hydrology (3 cr)	
						BIOL 391 Footprints on the James: The Human and Natural History of the James River Watershed (3 credits). Month long summer field class; completely taught on the river.	ENV 375 - Environmental Sciences of The San Juan River Basin (accelerated semester course with one week on San Juan River). (3 cr)	
						BIOL 391 South African Summits to Seas: Human and Natural History of kwaZulu-Natal (as viewed by traveling along major rivers) (3 credit winter expedition class)	CENE 562 - Water Quality Modeling (3 cr)	
						BIOL 535. Wetlands Ecology (4 credits)	BIO 571- Field Ecology (2-3 cr)	
						BIOL/ENVS 503 Fish Biology (4 credits)	GLG 451- Hydrogeology (4 cr)	
						BIOL 532. Water Pollution Biology	FOR 340/L - Environmental Hydrology (4 cr)	
						BIOL 5XX Restoration Ecology	FOR 560 - Wetland Ecology and Management (3 cr)	
							FOR 382/582- Ecological Restoration/ Applications (3 cr)	
						ENVS 556. Historical and Cultural Landscapes (3 credits). Emphasis on riverine landscapes	GLG 670 - Advanced Hydrogeology (4 cr)	
							FOR 222- Environmental Conservation (3 cr)	

River Policy (choose ONE):

CMU	Prescott College	SNC	U of U	WWU	MSU	VCU	NAU	UTC
POLS 488 – Environmental Politics and Policy (3 cr)	ENV40000 - River Ecology & Conservation (4 cr)	BIOL 407 Conservation Biology	POLSS 5510: Water Policy and Politics (3 cr)	ENVS 426 Water Resources (4 cr)	RPLS 475 – Public Land/Water Use Policies (3 cr)	BIOL 510 Conservation Biology (3 credits)	GSP 402 - Environmental Impact Analysis: Assessing Project Impacts Under The National Environmental Policy Act (3 cr)	ESC 4100 - Environmental Law and Agencies (3 cr)
	ENV21550/ENV41550 - Water in the West (4 cr)	ENVP 425 Environmental Law		ENVS 451 Natural Resource Policy (3 cr)	ENVR 470 Environmental Assessment	ENVS 311 Politics of the Environment (3 credits)	ENV 425/525 Water Resources Policy and Management (3 cr)	
	ENV42020 - Conservation Biology (4cr)	ENVP 423 Environmental Planning and Policy		ESCI 496 Integration of Environmental Science and Policy (3 cr)	RPLS 481 (3 cr) Park Planning	ENVS 300 Sustainable Societies: James River Basin (3 CR)	FOR 430 - Leadership and the Environment (3 cr)	

**River Studies and Leadership Certificate
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	ENV42750 - Wetland Ecology & Management (4 cr)				URBS 461 Environmental Planning	URSP 650. Natural Resources and Environmental Planning (3 credits)	GSP 206 - Public Participation and Communication (3 cr)	
						ENVS 640. River Policy (3 credits)	FOR 230 - Multicultural Perspectives of Natural Resource Management (3 cr)	
						ENVS 628. Environmental Policy and Administration (3 credits)	FOR 445 - Wilderness Management (3 cr)	
						ENVS 660. Virginia Environmental Law	FOR 360 - Natural Resources Policy (3 cr)	
						BIOL 610. Conservation Applications	PHI 331 - Environmental Ethics (3 cr)	
							ENV 555- The Environmental Science-policy Interface (3 cr)	
							POS 359/659- Environmental Policy (3 cr)	

Swiftwater Rescue Core Courses (choose ONE):

CMU	Prescott College	SNC	U of U	WWU	MSU	VCU	NAU	UTC
Level 4 American Canoe Association Swiftwater Rescue Course through CMU Outdoor Program (1 cr – KINA topics course)	AE2449/AE4449 - River Guides Training & Swiftwater Rescue (4 cr)	PHED XXX Swiftwater Rescue (TBA)	H ED 4510: Swiftwater Rescue Techniques and Theory (3 cr)	PE 177 Basic Kayak (1 cr)	Swiftwater Rescue Technician through MNSCu system at Vermillion College or Winona State (3 cr)	ENVS 491 Special topics: Level 4 American Canoe Association Swiftwater Rescue Course (1 credit)	PRM 203- Intro to White Water Rafting (1 cr)	Extracurricular Basic River Rescue, Swiftwater Rescue, or Whitewater Rescue Technician course offered by numerous local/region river rescue providers. The Department will create and maintain a list of qualifying courses.
							PRM 210- Intro to Kayaking (1 cr)	
							PRM 399 – Special Topics: Swiftwater Rescue	

Emphasis Coursework (Choose ONE emphasis area)

River Science Emphasis Area Courses (choose TWO)

CMU	Prescott	SNC	U of U	WWU	MSU	VCU	NAU	UTC
GEOL 355 - Basic Hydrology (3 cr)	ENV42724 - Restoration Ecology: Watersheds of the Southwest (4 cr)	ESCI 280 Stream Ecology (1cr)	GEOG 2000: Utah's Backyard: An Introduction to Field-Based Physical Geography (3 cr)	ESCI 315 The Art, Science, and Ethics of Fly fishing (3 cr)	BIOL 404 (4) Wetlands	ENVS 201. Earth Systems Science	GSP 259 - Principles Of Geomorphology (3 cr)	BIOL 4110 - Ichthyology (4 cr)
ENVS 331/331L - Water Quality (4 cr)	ENV40000 - River Ecology & Conservation (4 cr)	BIOL 421/425 Aquatic Ecology and lab (4cr)	GEOG 3200/5200: Geomorphology: Mountains, Rivers and Deserts (4 cr)	ESCI 316 Advanced Fly fishing: River Stewardship, Reflection, and Native Trout (2 cr)	BIOL 432 (4) Lake Ecology	BIOL 335. Global Change Biology (3 credits)	CENE 568 - Engineering in Natural Systems: Rivers and Streams (3 cr)	ESC 4460 - Global Change Biology (3 cr)
BIOL 414/414L – Aquatic Biology (4 cr)	ENV 42XX – Hydrology (4 cr)	ESCI 320 Climate Change (3 cr)	GEOG 3290/5290: Water in Utah (3 cr)	ESCI 410 Habitat and Ecology of Pacific Salmon and Trout (3 cr)	GEOL 320W (4) Sedimentology and Stratigraphy	BIOZ 491. River rock pool ecology	GSP 150 - Physical Geography: Air, Water, Earth And Life (4)	ESC 4520 – Limnology and Reservoir Ecology (4cr)

**River Studies and Leadership Certificate
Accepted Courses**

GEOL 402/402L – Applications of Geomorphology (4 cr)	ENV42020 - Conservation Biology (4cr)	ESCI 301/305 Hydrology and Water Resources (4 cr)	GEOG 3350: Resource Conservation and Environmental Management (3 cr)	ESCI 431 Watershed Biogeochemistry (3 cr)	GEOG 315 (3) Geomorphology	BIOL 430. Invasion Biology (3 credits)	ENV 440/L/ or 540/L - Conservation Biology/Lab (4 cr)	ESC 4530 - Microbial Ecology (4 cr)
BIOL 336 – Fish Biology (3 cr)	ADV25008 - In the Creeks & Canyons: Explorations of the Mogollon Rim (4 cr)	ENVS 360 Natural History of the Rogue River (3 cr)	GEO 5350/6350/7350: Groundwater (3 cr)	ESCI 470 Ecological Restoration (5 cr)	GEOL 350 (4) Environmental Geology	BIOL XXX/ENVS XXX Enviro-techniques 1	GLG 112/L - Geologic Disasters (4 cr)	GEOL 4080 - Geomorphology and Earth Surface Processes (4 cr)
	ENV44720 - Environmental Problem Solving: A Spatial Approach (4 cr)		GEO 5390/6390/7390: Solute Transport and Subsurface Remediation (3 cr)	GEOL 472 Surface Water Hydrology (4 cr)	GEOL 450 (3) Hydrogeology	BIOL XXX/ENVS XXX Enviro-techniques 2	GLG 451 – Hydrogeology (4 cr)	GEOL 4450 - Hydrology (4 cr)
			CVEEN 5410/6410: Watershed Modeling (3 cr)		GEOG 103 (4 cr) Physical Geography emphasis on Minnesota River	BIOL 391 Footprints on the James: The Human and Natural History of the James River Watershed (3 credits). Month long summer field class; completely taught on the river.	CENE 562 - Water Quality Modeling (3 cr)	
						BIOL 391 South African Summits to Seas: Human and Natural History of kwaZulu-Natal (as viewed by traveling along major rivers) (3 credit winter expedition class)	GLG 670 - Advanced Hydrogeology (4 cr)	
						BIOL 535. Wetlands Ecology (4 credits)	GLG 259/ L – Geomorphology (1 cr)	
						BIOL/ENVS 503 Fish Biology (4 credits)	FOR 563 - Watershed Hydrology (3 cr)	
						BIOL 532. Water Pollution Biology	FOR 565 - Watershed Restoration (3 cr)	
						BIOL 5XX Restoration Ecology	ENV 324 - Sustainable Ecology (3 cr)	
						ENVS 556. Historical and Cultural Landscapes (3 credits). Emphasis on riverine landscapes	BIO 568 - Conservation and Management of Imperiled Species (3 cr)	
							ENV 326/L - Essential Ecology (4 CR)	
							ENV 544 - Landscape Ecology (3 cr)	
							FOR 340/L - Environmental Hydrology (4 cr)	
							FOR 560 - Wetland Ecology and Management (3 cr)	

River-based Policy and Management Emphasis Area Courses (choose TWO courses):

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POLS 488 – Environmental Politics and Policy (3 cr)	ENV40000 - River Ecology & Conservation (4 cr)	ENVS 2XX Natural Resources Management (3 cr)	CMP 5350/6350: Public Lands and Environmental Policy (3cr)	ENVS 426 Water Resources (4 cr)	RPLS 475 (3 cr) Public Land/Water Use Policies	BIOL 510 Conservation Biology (3 credits)	ENV 425/525 Water Resources Policy and Management (3 cr)	ECON 4300 - Environmental Economics (3 cr)

**River Studies and Leadership Certificate
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	ENV21550/ENV41550 – Water in the West (4 cr)	ENVS 4XX Natural Resource Economics (3 cr)	CPM 5360/6360: Environmental Planning Law and Policy (3 cr)	ENVS 450 Science in the Policy Process (4 cr)	RPLS 479 (3 cr) Wildland/water Recreation Management	ENVS 311 Politics of the Environment (3 credits)	GSP 402 - Environmental Impact Analysis: Assessing Project Impacts Under the National Environmental Policy Act (3 cr)	ECON 4550 – Urban Economics (3 cr)
	ENV42020 – Conservation Biology (4cr)	BIOL 407 Conservation Biology (3 cr)	Civil and Environmental Engineering 6480/Philosophy 5540: Hydroptopia (3 cr)	ENVS 451 Natural Resources Policy (3 cr)	RPLS 481 (3 cr) Park Planning	ENVS 300 Sustainable Societies: James River Basin (3 credits)	GSP 421 - Land Use Planning Law and Ethics (3 cr)	ESC 4070 - Environmental Conservation (3 cr)
	ENV24700/ENV44700 - Park & Wilderness Management (4 cr)	ENVP 425 Environmental Law (3 cr)		ENVS 463 Native American Planning and Natural Resource Policy (3 cr)	URBS 461 Environmental Planning	URSP 650. Natural Resources and Environmental Planning (3 credits)	GSP 514 - Planning Sustainable Communities (3 cr)	ESC 4300 - Problems in Environmental Management (3 cr)
	ENV42750 - Wetland Ecology & Management (4 cr)	ENVP 423 Environmental Planning and Policy (3 cr)		ESCI 496 Integration of Environmental Science and Policy (3 cr)	ENVR 470 Environmental Assessment	ENVS 640. River Policy (3 credits)	ECO 324 - Environmental Economics (3 cr)	ESC 4830 – Economics and the Environment (3 cr)
						ENVS 628. Environmental Policy and Administration (3 credits)	FOR 255 - International Wildlife Issues (3 cr)	PSPS 3420 - American Public Policy (3 cr)
						ENVS 660. Virginia Environmental Law	AIS 470 - Traditional Ethno-Biological Knowledge of Indigenous Peoples (3 cr)	PSPS 3430 - Urban Public Policy (3 cr)
						BIOL 610. Conservation Applications	ENV 385W - Energy, Resources and Policy (4 cr)	PSPS 3520 - Leadership and Management in the Public Sector (3 cr)
							ENV 555 - The Environmental Science-policy Interface (3 cr)	PSPS 3620 - Public Service Law & Ethics (3 cr)
								PSPS 3710 - Comparative Public Policy (3 cr)

River-based Recreation, Education, and Tourism Emphasis Area Courses (choose TWO courses):

CMU	Prescott	SNC	U of U	WWU	MSU	VCU	NAU	UTC
	Grand Canyon Wilderness Explorations & Landscape Studies, ADV21026 - Phase I: Expeditionary & Technical Skills for Rivers & Canyons (4 cr), ENV41027 - Phase II: Landscape Ecology (4 cr), ENV41028 - Phase III: Teaching and Research on Public Lands. Conservation and Management Challenges in Grand Canyon (4cr)	ODAL 301 Fundamentals of Environmental Interpretation	PRT 3050: Natural Resources Learning, Federal Lands: Wilderness Safety and Survival (3 credits)	ENVS 483 Environmental Interpretation (4 cr)	RPLS 350 (3) Natural Resource Interpretation Methods	BIOL 391 Footprints on the James: The Human and Natural History of the James River Watershed (3 credits). Month long summer field class; completely taught on the river.	GSP 276 - Planning for Sustainable Tourism (3 cr)	HHP 1050 - Adventure Tourism (3 cr)
	ADV24050 - Environmental Perspectives & Whitewater Rafting (4 cr)	ODAL 380 River Expedition Rogue River	PRT4430: Environmental Interpretation and Communication (3 credits)	RECR 272 Introduction to Outdoor Recreation (3 cr)	RPLS 479 (3) Wildland Recreation Management	BIOL 391 South African Summits to Seas: Human and Natural History of kwaZulu-Natal (as viewed	PRM 346W - Outdoor Recreation (3 cr)	HHP 3010 - Principles of Tourism (3 cr)

**River Studies and Leadership Certificate
Accepted Courses**

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	ADV21010 - Environmental Topics in Adventure Education (4 cr)	SUST 480 Special Topics; Geotourism (3 cr)	PRT 5180: Field Ecology in PRT (3 credits)	RECR 279 Introduction to Tourism (3 cr)	RPLS 282 (3) Wildlife as a Recreation Resource	OAP XXX - Experiential Education & Outdoor Leadership (concept)	PRM 300 – Ecotourism (3 cr)	HHP 3060 - Outdoor Recreation (3 cr)
	ADV2449/ADV4449 - River Guides Training & Swiftwater Rescue (4 cr)	PHED 2XX Whitewater Kayaking (1 or 2 cr)	PRT 5420 / 6420: Ecology and Management of Wildland Recreation Settings (3 credits)	RECR 370 Outdoor Program Development (4 cr)	RPLS 478 (3) Review of Outdoor Recreation Research	ENVS 556. Historical and Cultural Landscapes (3 credits). Emphasis on riverine landscapes	GSP 376 - Critical Geographies of Global Tourism and Recreation (3 cr)	COMM 4100 - Public Communication and Environmental Issues (3 cr)
	ADV 2251 – Canoeing: Introduction to Expeditionary Paddling (4 cr)		PRT 5430: Recreation Issues in Human Dimensions of Wildlife (3 credits)	RECR 379 Foundations of Ecotourism (4 cr)		URSP 520. Park Planning (3 credits)	FOR 500- Ecosystem Science and Management Principles (3 cr)	
	AE2223/4223 - Whitewater Kayaking and Swiftwater Rescue (4 cr)						PRM 515- Experience Marketing in Recreation and Tourism (3 cr)	
	AE4253 – Expeditionary Rivers (4 cr)							