California State University Channel Islands

Program Modification

Program modifications must be submitted by October 15, 2010, and finalized by the end of the fall semester for catalog production.
Enter data in YELLOWED areas.

Date (Change if modified and update the file name with the new date): 2010 2011 Catalog Copy; revised 11.15.10
Program Area: ESRM
Semester /Year First affected:

Instructions: Please use this Program Modification form for changes to existing program requirements, units, outcomes, emphases or options, or for other programmatic concerns. For minor changes (faculty or address changes, additions of approved electives, minor editing for clarity, and other minor updates) use the Program Update form, available at the Curriculum website.

Paste the latest approved version of your entire program in the left AND right boxes below. Make your deletions in the LEFT column by using the strikeout feature in Word or underlining, and highlight. Insert new language or other changes to the program on the RIGHT and highlight in YELLOW for easy identification. If possible, please align the two columns so that changes appear side-by-side with the original text.

CURRENTLY APPROVED PROGRAM	PROPOSED PROGRAM
Environmental Science and Resource Management Programs Offered • Bachelor of Science in Environmental Science and Resource Management Emphasis in Environmental Science Emphasis in Resource Management • Minor in Environmental Science and Resource Management Today's environmental problems call for individuals who are educated in more than one discipline, highly trained in technical skills, and aware of the political, economic, and social dimensions of environmental decisions. The Bachelor of Science in Environmental Science and Resource Management provides solid training in basic physical, biological, and social sciences, and application of management science to reduce adverse impacts of human activity on the environment and to maximize the	Environmental Science and Resource Management Programs Offered • Bachelor of Science in Environmental Science and Resource Management Emphasis in Environmental Science Emphasis in Resource Management • Minor in Environmental Science and Resource Management Today's environmental problems call for individuals who are educated in more than one discipline, highly trained in technical skills, and aware of the political, economic, and social dimensions of environmental decisions. The Bachelor of Science in Environmental Science and Resource Management provides solid training in basic physical, biological, and social sciences, and application of management science to reduce adverse impacts of human activity on the environment and to maximize the

benefits that accrue from environmental resources.

In the narrowest sense, environmental science is the study of the impact of human systems on physical and biological systems, and the dependence on natural resources by human systems. In a broader sense, environmental science is the study of the interaction and co-evolution of human, physical, and biological systems. Natural science is the study of physical and biological systems. Social science is the study of human systems - economic systems, political systems, human perceptions, and human interactions. Environmental science requires integral knowledge of both natural and social science. Resource management is concerned with the most effective means of avoiding damage to environmental assets and extracting beneficial uses of environmental resources, within the context of social institutions. Effective resource management considers benefits and costs, uncertainties and risks, limits of knowledge, institutional constraints, and social and political forces.

The B.S. program has two emphases: environmental science and resource management. This program prepares graduates specializing in environmental science who understand basic principles of resource management, and graduates specializing in resource management who understand basic principles of environmental science. Most required courses are those offered in related disciplines. The curriculum fosters cross-disciplinary communication in the several required courses common to both degree programs and particularly in the Environmental Science and Resource Management courses.

Careers

This curriculum prepares students for professional careers in Environmental Science and Resource Management and for subsequent graduate study. For graduates completing the program of study required for the BS degree in Environmental Science and Resource Management, there are ample career opportunities working on environmental problems in industry, government, and non-profit organizations. The degree will also prepare students for graduate programs in either Environmental Science or Resource Management. For example, students might pursue a Ph.D. in Environmental Science at UCLA or in Environmental Science and Policy at UC Santa Barbara.

Program Learning Outcomes

Students graduating from the ESRM program will be able to:

- Identify the scientific, social scientific and humanistic aspects of environmental issues;

benefits that accrue from environmental resources.

In the narrowest sense, environmental science is the study of the impact of human systems on physical and biological systems, and the dependence on natural resources by human systems. In a broader sense, environmental science is the study of the interaction and co-evolution of human, physical, and biological systems. Natural science is the study of physical and biological systems. Social science is the study of human systems - economic systems, political systems, human perceptions, and human interactions. Environmental science requires integral knowledge of both natural and social science. Resource management is concerned with the most effective means of avoiding damage to environmental assets and extracting beneficial uses of environmental resources, within the context of social institutions. Effective resource management considers benefits and costs, uncertainties and risks, limits of knowledge, institutional constraints, and social and political forces.

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This curriculum prepares students for professional careers in Environmental Science and Resource Management and for subsequent graduate study. For graduates completing the program of study required for the BS degree in Environmental Science and Resource Management, there are ample career opportunities working on environmental problems in industry, government, and non-profit organizations. The degree will also prepare students for graduate programs in either Environmental Science or Resource Management. For example, students might pursue a Ph.D. in Environmental Science at UCLA or in Environmental Science and Policy at UC Santa Barbara.

Program Learning Outcomes

Students graduating from the ESRM program will be able to:

- Identify the scientific, social scientific and humanistic aspects of environmental issues;

- Identify, locate, evaluate, synthesize and present current research and information on environmental issues;
- Define environmental problems from the perspectives of both environmental science and resource management;
- Identify possible causes and propose solutions to environmental problems from the perspectives of both environmental science and resource management;
- Evaluate proposed solutions to environmental problems from the perspectives of both environmental science and resource management;
- Use the methodologies of the natural and social sciences to formulate testable hypotheses concerning environmental problems and issues;
- Collect, organize, analyze, interpret and present quantitative and qualitative data; and
- Make use of current, technological tools in the collection, organization, analysis and interpretation of data.

Faculty

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- Identify, locate, evaluate, synthesize and present current research and information on environmental issues;
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- Identify possible causes and propose solutions to environmental problems from the perspectives of both environmental science and resource management;
- Evaluate proposed solutions to environmental problems from the perspectives of both environmental science and resource management;
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Contact Information
http://esrm.csuci.edu/

Bachelor of Science Degree in Environmental Science and Resource Management - (120 units)

Lower Division Requirements - 37 - 39 units

BIOL	200	Principles of Organismal and Population Biology	4
BIOL	201	Principles of Cell and Molecular Biology	4
CHEM	121	General Chemistry I	4
CHEM	122	General Chemistry II	4
ECON	110	Principles of Microeconomics	3
ECON	111	Principles of Macroeconomics	3
ESRM	100	Introduction to Environmental Science and Resource Management	3
ESRM	200	Principles of Resource Management, Conservation, and Stewardship	3

Select one of the following:

MATH	140	Calculus for Business Applications	3
MATH	150	Calculus I	4

Select one of the following:

GEOL	121	Physical Geology	4
GEOL	122	Historical Geology	3

Select one of the following:

BIOL	203	Quantitative Methods for Biology	3
MATH	202	Biostatistics (PSY)	3
MATH	329	Statistics for Business and Economics	3

Upper Division Requirements - 27 units

BIOL	433	Ecology and the Environment	4
ECON	362	Environmental Economics	3

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Lower Division Requirements - 37 - 39 units

BIOL	200	Principles of Organismal and Population Biology	4
BIOL	201	Principles of Cell and Molecular Biology	4
CHEM	121	General Chemistry I	4
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ECON	110	Principles of Microeconomics	3
ECON	111	Principles of Macroeconomics	3
ESRM	100	Introduction to Environmental Science and Resource Management	3
ESRM	200	Principles of Resource Management, Conservation, and Stewardship	3

Select one of the following:

MATH	140	Calculus for Business Applications	3
MATH	150	Calculus I	4

Select one of the following:

GEOL	121	Physical Geology	4
GEOL	122	Historical Geology	3

Select one of the following:

BIOL	203	Quantitative Methods for Biology	3
MATH	202	Biostatistics (PSY)	3
MATH	329	Statistics for Business and Economics	3

Upper Division Requirements - 27 units

BIOL	433	Ecology and the Environment	4
ECON	362	Environmental Economics	3

ENGL	337	Literature of the Environment	3
ESRM	313	Conservation Biology (BIOL)	4
ESRM	328	Introduction to Geographical Information Systems	3
ESRM	329	Environmental Law and Policy	3
ESRM	342	Environmental History (HIST)	3
ESRM	341	The National Park (POLS)	3
or			
ESRM	342	Environmental History (HIST)	3
ESRM	491	Capstone Preparation	1
ESRM	499	Capstone	3

All students must select an emphasis in Environmental Science or Resource Management and the associated coursework.

Emphasis in Environmental Science - 16 units

ESRM	352	Theory and Practice of Ecological Restoration	3
CHEM	250	Quantitative Analysis	3
CHEM	251	Quantitative Analysis Laboratory	1

Select a total of nine units from the following courses:

BIOL	301	Microbiology	4
BIOL	310	Vertebrate Biology	4
BIOL	312	Marine Biology	4
BIOL	316	Invertebrate Zoology	4
BIOL	333	Emerging Public Health Issues	3
BIOL	334	Natural History of Ventura County	3
BIOL	402	Toxicology	3
BIOL	432	Principles of Epidemiology and Environmental Health	3
BIOL	450	Ichthyology: The Biology of Fishes	4
BIOL	451	Ornithology	4
CHEM	311	Organic Chemistry I	3
CHEM	312	Organic Chemistry I Laboratory	1
CHEM	314	Organic Chemistry II	3
CHEM	315	Organic Chemistry II Laboratory	1
CHEM	318	Biological Chemistry	3
CHEM	344	Energy and Society (PHYS)	3

ENGL	337	Literature of the Environment	3
ESRM	313	Conservation Biology (BIOL)	4
ESRM	328	Introduction to Geographical Information Systems	3
ESRM	329	Environmental Law and Policy	3
ESRM	342	Environmental History (HIST)	3
ESRM	341	The National Park (POLS)	3
or			
ESRM	342	Environmental History (HIST)	3
ESRM	491	Capstone Preparation	1
ESRM	499	Capstone	3

All students must select an emphasis in Environmental Science or Resource Management and the associated coursework.

Emphasis in Environmental Science - 16 units

ESRM	352	Theory and Practice of Ecological Restoration	3
CHEM	250	Quantitative Analysis	3
CHEM	251	Quantitative Analysis Laboratory	1

Select a total of nine units from the following courses:

BIOL	301	Microbiology	4
BIOL	310	Vertebrate Biology	4
BIOL	312	Marine Biology	4
BIOL	316	Invertebrate Zoology	4
BIOL	333	Emerging Public Health Issues	3
BIOL	334	Natural History of Ventura County	3
BIOL	402	Toxicology	3
BIOL	432	Principles of Epidemiology and Environmental Health	3
BIOL	450	Ichthyology: The Biology of Fishes	4
BIOL	451	Ornithology	4
CHEM	311	Organic Chemistry I	3
CHEM	312	Organic Chemistry I Laboratory	1
CHEM	314	Organic Chemistry II	3
CHEM	315	Organic Chemistry II Laboratory	1
CHEM	318	Biological Chemistry	3
CHEM	344	Energy and Society (PHYS)	3

ENGL	482	Technical Writing	3
ENGL	483	Technical Visual Communication	3
ESRM	350	Ecological Restoration Design and Construction	4
ESRM	351	Field Methods: Monitoring and Assessment	4
ESRM	428	Intermediate Geographic Information Systems	3
ESRM	443	Environmental Communication (COMM)	3
~~ESRM~~	~~490~~	~~Special Topics~~	~~3~~
ESRM	492	Service Learning/Internship	3
ESRM	494	Independent Research	1-3
MATH	430	Research Design and Data Analysis	3
PHYS	201	General Physics II	4

Emphasis in Resource Management - 16 units

Select three courses from the following

ESRM	428	Intermediate Geographic Information Systems	3
ESRM	462	Coastal and Marine Resource Management	4
ESRM	463	Water Resources Management	4
ESRM	464	Land Use Planning and Open Space Management	4

Select a total of four units from the following courses:

BIOL	311	Plant Biology and Ecology	4
BIOL	450	Ichthyology: The Biology of Fishes	4
BIOL	451	Ornithology	4
ECON	464	Natural Resource Economics	3
ECON	480	Topics in Environmental and Natural Resource Economics	3
ECON	488	Applied Managerial Econometrics	4
ENGL	482	Technical Writing	3
ENGL	483	Technical Visual Communication	3
ESRM	332	Human Ecology (ANTH)	3
ESRM	352	Theory and Practice of Ecological	

ENGL	482	Technical Writing	3
ENGL	483	Technical Visual Communication	3
ESRM	350	Ecological Restoration Design and Construction	4
ESRM	351	Field Methods: Monitoring and Assessment	4
ESRM	428	Intermediate Geographic Information Systems	4
ESRM	443	Environmental Communication (COMM)	3
~~ESRM~~	~~490~~	~~Special Topics~~	~~3~~
ESRM	492	Service Learning/Internship	3
ESRM	494	Independent Research	1-3
MATH	430	Research Design and Data Analysis	3
PHYS	201	General Physics II	4

Emphasis in Resource Management - 16 units

Select three courses from the following

ESRM	428	Intermediate Geographic Information Systems	4
ESRM	462	Coastal and Marine Resource Management	4
ESRM	463	Water Resources Management	4
ESRM	464	Land Use Planning and Open Space Management	4

Select a total of four units from the following courses:

BIOL	311	Plant Biology and Ecology	4
BIOL	450	Ichthyology: The Biology of Fishes	4
BIOL	451	Ornithology	4
ECON	464	Natural Resource Economics	3
ECON	480	Topics in Environmental and Natural Resource Economics	3
ECON	488	Applied Managerial Econometrics	4
ENGL	482	Technical Writing	3
ENGL	483	Technical Visual Communication	3
ESRM	332	Human Ecology (ANTH)	3
ESRM	352	Theory and Practice of Ecological	

		Restoration	3
ESRM	410	Environmental Impact Assessment	3
ESRM	428	Intermediate Geographic Information Systems	3
ESRM	482	Issues in Environmental Planning and Resource Management	3
~~ESRM~~	~~483~~	~~Issues in Global Resource Management~~	~~3~~
ESRM	490	Special Topics	3
ESRM	492	Service Learning/Internship	3
ESRM	494	Independent Research	1-3
MATH	430	Research Design and Data Analysis	3
MGT	307	Management of Organizations	3
MGT	428	Contract Management	3

Required Supporting and Other GE Courses - 38 - 40 units

University Electives	14-16
American Institutions Requirement	6
Other GE Courses	18

Minor in Environmental Science and Resource Management - (20 units)

The Environmental Science and Resource Management minor provides non-majors with the opportunity to explore environmental issues and examine human impacts on natural systems. It provides students with an understanding of how their personal choices affect the environment around them. In addition, it equips students for further study in environmental science, law, policy, or management.

Lower Division Requirements - 9 units

ESRM	100	Introduction to Environmental Science and Resource Management	3
ESRM	200	Principles of Resource Management, Conservation, and Stewardship	3

~~*Select one of the following courses:*~~

~~MATH~~	~~201~~	~~Elementary Statistics~~	~~*3~~
~~MATH~~	~~202~~	~~Biostatistics (PSY)~~	~~*3~~
~~BIOL~~	~~203~~	~~Quantitative Methods for Biology~~	~~*3~~

		Restoration	3
ESRM	410	Environmental Impact Assessment	3
ESRM	428	Intermediate Geographic Information Systems	4
ESRM	482	Issues in Environmental Planning and Resource Management	3
~~ESRM~~	~~483~~	~~Issues in Global Resource Management~~	~~3~~
~~ESRM~~	~~490~~	~~Special Topics~~	~~3~~
ESRM	492	Service Learning/Internship	3
ESRM	494	Independent Research	1-3
MATH	430	Research Design and Data Analysis	3
MGT	307	Management of Organizations	3
MGT	428	Contract Management	3

Required Supporting and Other GE Courses - 38 - 40 units

University Electives	14-16
American Institutions Requirement	6
Other GE Courses	18

Minor in Environmental Science and Resource Management - (21 units)

The Environmental Science and Resource Management minor provides non-majors with the opportunity to explore environmental issues and examine human impacts on natural systems. It provides students with an understanding of how their personal choices affect the environment around them. In addition, it equips students for further study in environmental science, law, policy, or management.

Lower Division Requirements - 6 units

ESRM	100	Introduction to Environmental Science and Resource Management	3
ESRM	200	Principles of Resource Management, Conservation, and Stewardship	3

~~*MATH 329 can be substituted for MATH 201, 202 or BIOL 203, but may not be double-counted as an upper division course.~~

Upper Division Requirements - 11 units

ESRM	313	Conservation Biology (BIOL)	4

Select one of the following courses:

ESRM	462	Coastal and Marine Resource Management	4
ESRM	463	Water Resources Management	4
ESRM	464	Land Use Planning and Open Space Management	4

Select three units from any of the following courses:

BIOL	334	Natural History of Ventura County	3
BIOL	345	Science and Public Policy (POLS)	3
CHEM	250	Quantitative Analysis	3
CHEM	251	Quantitative Analysis Lab	1
CHEM	311	Organic Chemistry I	3
CHEM	312	Organic Chemistry I Laboratory	1
ECON	362	Introduction to Environmental Economics	3
ECON	488	Applied Managerial Econometrics	4
ENGL	337	Literature of the Environment	3
ESRM	340	Politics and the Environment (POLS)	3
ESRM	342	Environmental History (HIST)	3
ESRM	440	Population Studies (SOC)	3
ESRM	443	Environmental Communication (COMM)	3
Any other 300-400 level ESRM course			3-4

Upper Division Requirements - 15 units

ESRM	313	Conservation Biology (BIOL)	4

Select two of the following courses:

ESRM	462	Coastal and Marine Resource Management	4
ESRM	463	Water Resources Management	4
ESRM	464	Land Use Planning and Open Space Management	4

Select three units from any of the following courses:

BIOL	334	Natural History of Ventura County	3
BIOL	345	Science and Public Policy (POLS)	3
CHEM	250	Quantitative Analysis	3
CHEM	251	Quantitative Analysis Lab	1
CHEM	311	Organic Chemistry I	3
CHEM	312	Organic Chemistry I Laboratory	1
ECON	362	Introduction to Environmental Economics	3
ECON	488	Applied Managerial Econometrics	4
ENGL	337	Literature of the Environment	3
ESRM	340	Politics and the Environment (POLS)	3
ESRM	342	Environmental History (HIST)	3
ESRM	440	Population Studies (SOC)	3
ESRM	443	Environmental Communication (COMM)	3
Any other 300-400 level ESRM course			3-4

SUMMARY OF CHANGES
Deactivation of ESRM 490 and ESRM 483 requires removal of these courses from the curricula. Dropping the math requirement from the minor.

JUSTIFICATION
By eliminating the math requirement the ESRM minor will reflect more depth in the discipline and allow ESRM to serve a greater student population at the University.

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Proposer of Program Modification Date

Program:

Program Chair		
	Signature	Date

Curriculum Chair		
	Signature	Date

Dean of Faculty		
	Signature	Date