

Catalog

Subject Code	Catalog Number	Course Title	Description	Academic Org Desc	Academic Career Desc	Crosslisted courses
DVP	600	Foundations of Development	This intensive pre-program course will be taught over a three-week period prior to the start of fall semester, when each new cohort is convened. It is designed to create a shared basic understanding of development for students with different academic and practitioner backgrounds and presents the context of development as a historical process, weaving in the major theories, concepts, and practice strategies that have defined its particular trajectory.	Geography & Dev, Sch of	Graduate	-
	601	Principles of Social Science for Development: Themes, Theories, and Strategies	This course will introduce students to key social science analytical tools relevant to development. It provides training in major development theories and practices through a social justice and rights-based lens and prepares students to understand how relations of power at local and global scales intersect with and shape development efforts.	Geography & Dev, Sch of	Graduate	-
	602	Role of Culture in Sustainable Development	This course emphasizes the cultural and spatial dimensions to development practice and promotes sensitivity to the unique development practice challenges related to language and culture. Students are exposed to a range of regional contexts and are expected to expand their knowledge and understanding of a specific cultural area. The specific regional themes focus on the impacts of culture on problems related to health and nutrition, natural resource management, governance, and economic decision-making, among other. Faculty from different core competency disciplines will participate in this course.	Geography & Dev, Sch of	Graduate	-
	603	Macro and Micro-economic Tools for Development Practice	The development practitioner must be able to understand the nature of household, farm, community and national economic decision making and the impacts of the economic incentives that present themselves through market forces and public policies. This course introduces fundamental principles and tools of analysis used in micro and macro-economics, especially as they relate to household decision making and to policy impacts in a developing world context. The course introduces the measures and meaning of poverty and emphasizes the dynamic interrelationships between larger level forces, such as national finance, trade and fiscal policy, and the allocative decisions that are made at a local level. Students will learn specific tools to analyze these micro-macro relationships in terms of poverty reduction outcomes and the sustainable natural resource management.	Geography & Dev, Sch of	Graduate	-
	611	Global Health Case Studies and Community Responses	This intensive cross-disciplinary global health and nutrition course will highlight lessons learned from community based research on high priority health problems spanning child survival; malnutrition and its behavioral determinants; infectious, vector born and emerging zoonotic diseases; reproductive and sexual health; lifestyle related disease; chronic disease and aging; health care seeking behavior in pluralistic health care arenas; and primary health care interventions. The course places an emphasis on understanding health and health care challenges in the social, cultural and political economic contexts of developing countries. Students will gain critical problem solving skills that will enable them to conduct formative research in their own countries toward the end of developing viable health care and nutrition programs.	Geography & Dev, Sch of	Graduate	-
	620	Introduction to Natural Systems	This course presents the basic concept and principles of ecosystem analysis, the services those ecosystems provide, and the impacts of human-environment interactions. Instructional units will provide a clear understanding of the ecology and management of arid and semi-arid lands, rangelands, and forests. The importance to development of hydrologic resources (water availability and quality) in all of these environments will be explored with specific emphasis on the concepts of ecohydrology and watershed management. These units will be followed by instruction in the current concepts and practices in wildlife and fisheries conservation and management and will emphasize the importance of the biotic resources of ecosystems.	Geography & Dev, Sch of	Graduate	-
	621	Natural Resources Managements: Applications	This course focuses on the management of natural resources within ecosystems. It introduces students to the management of land and water resources in the context of developing countries. Technical unites explore the management and engineering of irrigation systems, water and sanitation, alternative sources for energy, integrated watershed management, and urban and rural land planning. The course also examines the human element of natural resource management as evidenced in resource-tenure systems, environmental policy, indigenous knowledge systems, participatory management practices, and collaborative management for ecosystem services. The course further introduces the student to techniques for monitoring development using remote sensing and geographic information systems, cost benefit analysis for planning, and multi-criteria decision analysis.	Geography & Dev, Sch of	Graduate	-
	630	Essential Management Principles for Development	This course introduces participants to the structure of development delivery services and the management skills that these delivery systems utilize. It first focuses on the organizational and operational characteristics of the principal development actors (bilateral and multilateral donors, international NGOs, local NGOs, national government agencies, foundations, etc.); then analyzes the sequential steps of the delivery process, including strategic planning, assessment, problem analysis / theory of change, project design, monitoring and evaluation, project administration, proposal development and policy analysis. This course will be administered by a combination of TANGO International Executive Officers and qualified guest lecturers with expertise in relevant fields.	Geography & Dev, Sch of	Graduate	-
	631	Methods II: Research & Data Analysis Tools & Applications for Development Practice	Building on the introductory methods course, this course reinforces the basic qualitative and quantitative tool set, including rapid appraisal, participatory appraisal, formal surveys, team ethnography, and so forth. The course further introduces the use of GIS, remote sensing, and other techniques into development problem solving (e.g. in community vulnerability mapping). This course also focuses on the skills needed for the management and analysis of qualitative and quantitative data using standard software packages, as well as the professional interpretation and presentation of findings. Students will apply these techniques to data collected during the previous summer field practicum, in this way integrating the applied field experience into the classroom. Student teams research projects, in collaboration with community partners.	Geography & Dev, Sch of	Graduate	-
	640	Methods in Development Practice	This course introduces students to the "culture of inquiry", the basic principles of applied, problem-solving research, and the logic of a mixed methods approach. It then relates research methodology to the development context as defined by the project cycle and project design principles, information systems and management, livelihood and vulnerability assessment (including health, nutrition, and environmental assessment), community and participatory planning, project monitoring and evaluation, and proposal development. In providing a comprehensive overview of the role of information in development, the course is designed to build decision skills in the choice of method and the management of information. Instruction will be provided by faculty and practitioner experts in these fields.	Geography & Dev, Sch of	Graduate	-
	641	Global Classroom: Integrated Approaches to Sustainable Development Practice	This course is designed to foster cross-border and cross-disciplinary collaboration through web-conferencing, online portals for interactive communication, and shared course management sites and to provide students with an introduction to the core competency areas and practical skills required of a development practitioner. The course provides students with a general introduction to the basic core competencies and practical skills required of a ? generalist? or ?integrative? development practitioner and serves as the foundation course for the Master?s in Development Practice (MDP) curriculum.	Geography & Dev, Sch of	Graduate	-
	642A	Cross Cohort Workshop	The course will co-convene first and second year MDP students. It is designed to promote a collaborative learning environment for both cohorts. First year students will be expected to prepare for an intensive summer field practicum and produce a proposal for their field projects. Second year students will analyze and present the findings of their projects conducted the previous summer and help to orient the first-year cohort in proposal development and field work. This course will provide a concrete context around which analytical concepts and methodological tools can be evaluated and refined.	Geography & Dev, Sch of	Graduate	-
	693	Internship	Specialized work on an individual basis, consisting of training and practice in actual service in a technical, business, or governmental establishment.	Geography & Dev, Sch of	Graduate	-
	694A	Summer Field Practicum in International Development	A core element of the Arizona MDP program is its field practicum. The purpose of the field practicum is to create a structured opportunity for field-tested learning on a closely mentored individual basis. The practicum experience engages students in an on-going specific development practice activity that utilizes cross-disciplinary skills, provides a concrete methodological experience, and involves collaboration and field interaction with local colleagues. The field practicum will be carried out with one of University of Arizona's long-term institutional partners in one of several countries including Brazil, Ethiopia, and Guatemala, or with the international development group TANGO International	Geography & Dev, Sch of	Graduate	-
	697B	Cross Cohort Workshop: Field Practicum Analysis and Professional Development	DVP 697B is part of a collaborative learning environment for both MDP cohorts. For the first third of the semester we will co-convene with DVP 642A. Those first-year graduate students will be expected to prepare for an intensive summer field practicum and produce a proposal for their field projects. DVP 697B, the second-year cohort, will utilize their own prior field experience to assist the first-year cohort in proposal development and field work. Additionally, DVP697B students will analyze the data and present the findings from their own field practicums. Lastly, DVP 697B emphasizes professional development. Each student will do guided preparation of a personal professional website, social media sites, a blog, and entry into a customized professional network. There will also be sessions on fundamentals of grant-writing and presentation skills.	Geography & Dev, Sch of	Graduate	-

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DVP	699	Independent Study	Qualified Development Practice students will work on an individual basis with professors who have agreed to supervise such work.	Geography & Dev, Sch of	Graduate	-
	909	Master's Report: The MDP Culmination Project	The Field Practicum will culminate with a Master's Project. In collaboration with field-partners and faculty advisors, students will develop a report on the field research objectives, methods, and outcomes. The Master's project will be refined in the cross-cohort seminar and presented to program faculty and first year students in class as part of the seminar requirements. Additionally, it is anticipated that the Master's Report will reflect each student's chosen second-year specialization within MDP. The project will be presented formally at the annual University of Arizona MDP Forum, involving faculty and leading representatives of the international development community and the MDP network. Student papers will contribute to the MDP Discussion Paper Series, available online as a forum for collaboration among students and faculty engaged in the MDP network and the broader international development community.	Geography & Dev, Sch of	Graduate	-
GEOG	500	Research Design	Focus on conceptualizing research projects and on writing and presenting a research proposal.	Geography & Dev, Sch of	Graduate	-
	501A	Planning Theory and Practice	This course is designed for advanced undergraduate students seeking careers in urban/regional planning, architecture, real estate development, and related fields. The primary objective of the course is to introduce students to the planning profession and the tracks of study within the University of Arizona's Planning Degree Program. Some of the topics covered during the semester include: the scope and objectives of urban planning; the evolution of the city and the profession of planning; ethics in planning; the place of planning within the government and the law; and selected topics of interest to planners. Graduate-level requirements include one additional project and leading in-class exercises.	Planning	Graduate	PLG 501A
	501B	Introduction to Planning	The second of a two-course sequence, this course is designed for first year graduate students, although well suited for advanced undergraduate students who are seeking careers in urban/regional planning, architecture, landscape architecture, real estate development, and related fields. The primary objective of the course is to introduce students to the planning profession. Some of the topics covered include: history of planning, land use planning, growth management, and the ethics of planning. Graduate-level requirements include writing an additional paper.	Planning	Graduate	PLG 501B
	503	Applications of Geographic Information Systems	General survey of principles of geographic information systems (GIS); applications of GIS to issues such as land assessment and evaluation of wildlife habitat; problem-solving with GIS. Graduate-level requirements include completion of a project on the use of GIS in their discipline or an original GIS analysis (100 points) in coordination with the instructor.	Renewable Natural Resources	Graduate	RNR 503
	507	The American Landscape	An in-depth exploration of how humans shape and are affected by a broad range of landscapes across the United States. Students will have the opportunity to learn about and apply a variety of methods for studying human-landscape interactions across a great diversity of contexts. These might include: city spaces, suburbs, seascapes, national parklands, agricultural lands, cold war landscapes, borderlands, and others. Graduate-level requirements include the completion of an essay and annotated bibliography on the work of a specific scholar, place, or region.	Geography & Dev, Sch of	Graduate	-
	510	Comparative Planning: Past, Present, and Future	Designed for planning students who expect to practice in a variety of national planning systems. The objective of this course is to provide a comparative survey of domestic planning systems in an international context. Additional topics covered include variations in the powers of local units of government and analysis of interjurisdictional competencies and conflicts. Graduate-level requirements include more required reading and are graded on analysis of readings in their logs.	Planning	Graduate	PLG 510
	514	Analytic Methods in Planning and Strategic Management	Methods and models for program planning and policy analysis; forecasting, service demand, facility location in capital investment programming, task sequencing, program analysis and evaluation.	Planning	Graduate	EPID 514 PA 514 PLG 514
	515	Introduction to Water Resources Policy	Water resources policy including the identification of regional problems of water use, the elements of water planning, water rights, and a consideration of institutional structures and processes. Graduate-level requirements include an in-depth term paper.	Hydrology & Atmospheric Sci	Graduate	HWRS 515
	516A	Computer Cartography	Introduces the principles of map design, production and analysis. Graduate-level requirements include an instructor approved 5-8 page paper on a related topic and analytical cartography demonstrating scholarly analysis in contemporary analytical cartography.	Geography & Dev, Sch of	Graduate	RNR 516A
	516C	Urban Geographic Information Systems	Introduces concepts and application skills for use of geographic information systems to investigate a range of urban spatial issues and decision-making processes. Emphasis on complete process of GIS-based problem solving, including project planning, spatial data sources/acquisition, preparation/coding, analysis, representation, and communication. Graduate-level requirements include writing an original research papers based on original data collected in the field.	Geography & Dev, Sch of	Graduate	PLG 516C RNR 516C
	516D	PPGIS: Participatory Approaches in Geographic Information Science	A project-based course focusing on applications and impacts of GIS and other spatial analysis technologies in grassroots community development, participatory decision making, and community-engaged social science. Class format includes discussion seminar, GIS workshop, collaboration, and out-of-classroom community involvement. Graduate-level requirements include writing an original research papers based on original data collected in the field.	Geography & Dev, Sch of	Graduate	PLG 516D RNR 516D
	516E	Geovisualization (GIS)	Introduces principles and practices of Geovisualization (Geoviz) and softwares (Community and ERDAS Image). Graduate-level requirements include an instructor-approved, scholarly paper on a related topic in Geoviz. The paper will be 5-8 double-spaced, typewritten pages and provide a scholarly analysis and critique of a significant real-world Geoviz application.	Geography & Dev, Sch of	Graduate	PLG 516E RNR 516E
	516F	GIS for the Social Sciences	An advanced course for students who want to integrate social science data and geographic information science into their research or work life. The course is presented in a lecture/laboratory format. The lecture portion will deal with conceptual issues necessary for the integration of social science data and approaches within a GIS framework. The laboratory portion will provide practical experience with GIS software products used for the development and analysis of spatially-referenced social science data sets. Graduate-level requirements include a 15 page term paper dealing with the integration of social science and GIS. Specific topics must be agreed upon in advance with the instructor. The paper will be completed in stages and due dates for selecting a topic, and for the completion of a precis, an outline and the paper will be posted on the course D2L site.	Geography & Dev, Sch of	Graduate	RNR 516F
	517	Geographic Information Systems for Natural and Social Sciences	Introduction to the application of GIS and related technologies for both the natural and social sciences. Conceptual issues in GIS database design and development, analysis, and display. Graduate-level requirements include a thorough bibliographic review and a scholarly paper on a current application of geographic information systems in the student's major field.	Renewable Natural Resources	Graduate	RNR 517
	519	Cartographic Modeling for Natural Resources	Computer techniques for analyzing, modeling, and displaying geographic information. Development of spatially oriented problem design and the use of logic are applied to the use of GIS programs. Emphasis on applications in land resources management and planning. Graduate-level requirements include a research paper.	Renewable Natural Resources	Graduate	RNR 519
	520	Advanced Geographic Information Systems	Examines various areas of advanced GIS applications such as dynamic segmentation, surface modeling, spatial statistics, and network modeling. The use of high performance workstations will be emphasized. Graduate-level requirements include a more extensive project and report.	Renewable Natural Resources	Graduate	RNR 520
	521C	Physical Climatology: Mechanisms of Change	The global and surface energy balance; the hydrologic cycle; the influence on climate of the atmospheric and oceanic circulation; climate history, sensitivity, modeling, and natural and anthropogenic change. Graduate-level requirements include a more quantitative and thorough understanding of the subject matter.	Hydrology & Atmospheric Sci	Graduate	ARL 521C ATMO 521C ENVS 521C
522	Resource Mapping	Use of computer technologies to map and inventory natural environments; integration of global positioning systems, remote sensing, and geographic information systems. Graduate-level requirements include a detailed report on the application of resource mapping to a specific problem in natural resource management.	Renewable Natural Resources	Graduate	RNR 522	
524	Integrated Geographic Information Systems	Addresses the theoretical rationale, current knowledge and methods for achieving a common spatial basis between remote sensing (image) and GIS (non-image) data. Graduate-level requirements include a scholarly semester project.	Geography & Dev, Sch of	Graduate	-	
529	Objective Analysis in the Atmospheric and Related Sciences	This graduate course provides an overview of statistical methods used to interpret datasets in the atmospheric and related sciences. The objective is to provide a working knowledge of the statistical tools most commonly used. Topics include application of basic statistics (composite analysis; significance testing; curve fitting; regression	Hydrology & Atmospheric Sci	Graduate	ATMO 529 GEOS 529	

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GEOG	529	Objective Analysis in the Atmospheric and Related Sciences	This graduate course provides an overview of statistical methods used to interpret datasets in the atmospheric and related sciences. The objective is to provide a working knowledge of the statistical tools most commonly used. Topics include application of basic statistics (composite analysis; significance testing; curve fitting; regression analysis; correlation; and non-normal distributions), non-parametric statistical significance testing (e.g. Monte-Carlo methods and field significance), matrix methods (principal component analysis; SVD analysis; CCA), and time series analysis (harmonic analysis; power spectra; data filtering; cross-spectrum analysis; singular spectrum analysis; and wavelet analysis).	Hydrology & Atmospheric Sci	Graduate	HWRS 529
	530	The Climate System	Systematic examination of processes and circulations comprising Earth's climate. Emphasis on circulations influencing geographic processes using examples of atmospheric environmental issues. Graduate-level requirements include the completion of a term paper.	Geography & Dev, Sch of	Graduate	ARL 530 GC 530
	531A	Traditional Ecological Knowledge	An introduction to the growing literature on traditional ecological knowledge and its relationships to the ecological and social sciences. Graduate-level requirements include preparing for and leading a class discussion on a specific topic.	American Indian Studies Cmt	Graduate	AIS 531A ANTH 531A ENVS 531A RAM 531A RNR 531A WFSC 531A WSM 531A
	532	Climate and Water	This course explores the connections between climate and water resources from the perspective of the past, the present, and the future to foster an appreciation of the finite nature of water in the western U.S. and other regions in the face of a changing climate.	Geography & Dev, Sch of	Graduate	-
	536A	Fundamentals of the Atmospheric Sciences	Broadly covers fundamental topics in the atmospheric sciences. Topics include composition of the atmosphere, atmospheric thermodynamics, atmospheric chemistry, cloud physics, radiative transfer, atmospheric dynamics, and climate. Graduate-level requirements include additional questions on homework and exams plus a term paper on a specialized research topic.	Hydrology & Atmospheric Sci	Graduate	ATMO 536A ENVS 536A HWRS 536A
	538	Biogeography	The role of historical events and ecological processes in determining the past and present geographic distribution of plants and animals. Graduate-level requirements include a research paper.	Geography & Dev, Sch of	Graduate	ECOL 538 GEOS 538
	539A	Introduction to Dendrochronology	Survey of dendrochronological theory and methods. Applications to archaeological, geological, and biological dating problems and paleoenvironmental reconstruction. Emphasis on dating methods, developing tree-ring chronologies, and evaluating tree-ring dates from various contexts. Graduate-level requirements include a research paper reviewing critically some aspect of dendrochronology.	Geosciences	Graduate	ANTH 539A GEOS 539A WSM 539A
	544	Entrepreneurial Innovation for Sustainable International Development	This course examines development-driven social entrepreneurship strategies through which individuals and small groups can have an innovative, scalable impact on sustainable development in the impoverished world (e.g., Sub-Saharan Africa). Students will address two non-traditional development questions: what is the impact of innovative, development-driven entrepreneurship and how can I collaborate with my peers in the developing world to utilize technology and markets for the betterment of impoverished societies? Graduate level requirements include a requirement to transfer the basics of their personal development project into a preliminary Logframe, the standard organizational template for development proposals. That task includes providing some assessment of costs, local needs and the sources of finance for your development entrepreneurship	Geography & Dev, Sch of	Graduate	-
	546	Health and the Global Economy	This course deals with the interconnection of the global economy, local social structures, and health, as well as examining disease and spatial aspects of health care, including access to care. Graduate-level requirements include a more substantive research paper.	Geography & Dev, Sch of	Graduate	GWS 546
	547	Global and Regional Climatology	Description and analysis of the atmospheric circulation process that produces differences in climates throughout the world. Emphasis on the earth's problem climates and climatically sensitive zones most susceptible to floods, droughts, and other environmental stresses due to global change. Graduate-level requirements include an additional term paper.	Geography & Dev, Sch of	Graduate	GEOS 547
	550	Geomorphology	Processes, form, and dynamics of the fluvial system from source to mouth. Introduction to aeolian, glacial, and planetary geomorphology. Graduate-level requirements include additional discussion section once a week.	Geosciences	Graduate	ARL 550 GEOS 550
	553	Advanced Location Theory	Advanced location theory, including such topics as spatial variation in costs and demand; consumer travel behavior; spatial competition and strategic marketing; geography of economic impacts; and the location of public and private facilities. This is a GIS-intensive course.	Geography & Dev, Sch of	Graduate	PLG 553
	555	Regional Geographies	Course provides focused training dedicated to a single region and can include fieldwork, lectures, and/or original research. Graduate-level requirements include writing original research papers based on original data collected in the field.	Geography & Dev, Sch of	Graduate	-
	557	Statistical Techniques in Geography, Regional Development and Planning	Methods of gathering and analyzing data for the solution of geographical, urban, and regional planning problems, with emphasis on quantitative and statistical techniques used in spatial analysis and cartography, on the one hand, and program planning, on the other. Graduate-level requirements include the completion of several data-intensive research projects.	Geography & Dev, Sch of	Graduate	PLG 557
	559	Land Use and Growth Controls	Lecture/seminar class designed for graduate planning students. Looks at basic and advanced land use, the tools utilized for land use planning, and the methodology of land use planning. Current planning and legal issues dealing with regulation of growth, the sequence of growth, and the limiting of growth are analyzed. Issues of equity in controlling land use are also explored. Graduate-level requirements include the completion of a series of research projects.	Planning	Graduate	PLG 559
	560	The Environmental History of East Asia	This course explores the mutual impact of culture and nature - how the natural environment has shaped culture, and how humans have impacted the natural environment (and to take this full circle, how human-induced changes in the natural environment subsequently impact societies). The relatively rapid and thoroughgoing transformations in East Asia over the past century allow us an ideal setting to explore the interaction between culture and nature. Focusing largely on China, Japan, Korea, and Vietnam, this course explores how the relatively new field of environmental history opens new dimensions of historical inquiry. Graduate-level requirements include extra reading of additional translations of primary sources, extra discussion time with the instructor, a research-oriented paper, and a different grading scheme.	East Asian Studies	Graduate	EAS 560 HIST 560
	563	Economic and Environmental Input-Output Analysis	This course provides the theory, techniques and hands-on experience necessary to understand input-output and its applications to a set of economic and environmental issues. Input-output has the capacity to measure linkages and the propagation of an economic or environmental shock across sectors and regions of an economy. It is commonly used for transportation planning, disaster relief, energy forecasting, environmental analysis (pollution attribution), social accounting models, and quantifying the impact of a terrorist attack. An important aspect of the course is to gain hands-on experience by applying the appropriate techniques and perform impact analysis with Microsoft Excel and PyIO (Python Input-Output).	Geography & Dev, Sch of	Graduate	-
	564	The Arid and Semi-arid Lands	Past, present and future of settlement and resource utilization in the world's arid lands; spatial interrelationships of environmental, demographic, socioeconomic and political systems.	Arid Lands Resrc Sciences, Cmt	Graduate	ARL 564
	565	Physical Aspects of Arid Lands	The climate, landforms, hydrology, soils and vegetation of deserts, with special emphasis on processes and distribution at micro-to-macro scales.	Arid Lands Resrc Sciences, Cmt	Graduate	ARL 565
	566	The Middle Eastern City and	Examines the physical and socioeconomic characteristics of the city in the Middle East and North Africa; the Islamic	Mid East & N	Graduate	MENA 566

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GEOG		Islamic Urbanism	city model, the traditional and contemporary bazaar and medina, urban evolution and transformation. Graduate-level requirements include additional readings and completion of an original research paper on an approved topic.	Afr Studies, Sch		
	567	Geographical Analysis of Population	Population distribution and change; practical methods of demographic analysis, migration, business and planning applications.	Geography & Dev, Sch of	Graduate	PLG 567
	568	Water and Sustainability	Social and environmental conflicts over water are intensifying in much of the world. This course studies the physical basis, history, and political economy of water development and water policy in the U.S. and internationally. Graduate-level requirements include additional reading every week and a term paper instead of the final exam.	Geography & Dev, Sch of	Graduate	-
	569	Water Resource Assessment	Focuses on watersheds, aquifers, and river basins as sources of water to meet human and environmental demands. Methods include watershed delineation, water budget and safe yield calculation, and water quality assessment. Models and decision support systems are reviewed. Graduate students taking the course will participate in a an all-day field trip and synthesize understanding in a comprehensive assessment of water resources with explicit emphasis on water policy linked to critical social and environmental processes across multiple scales.	Geography & Dev, Sch of	Graduate	-
	573	Spatial Analysis and Modeling	Explores the use of geographic information systems (GIS) as a tool for natural resource and environmental managers. Topics include spatial autocorrelation, interpolation techniques, and model integration. Examines sources of error and possible ramifications. Graduate-level requirements include the students to show additional, sophisticated proficiency with the material through the completion of a final course project, consisting of an additional analysis of data provided by the students (see syllabus for point breakdown).	Renewable Natural Resources	Graduate	RNR 573
	574G	Introduction to Geostatistics	[Taught Spring semester in odd-numbered years] Exploratory spatial data analysis, random function models for spatial data, estimation and modeling of variograms and covariances, ordinary and universal kriging estimators and equations, regularization of variograms, estimation of spatial averages, non-linear estimators, includes use of geostatistical software. Application of hydrology, soil science, ecology, geography and related fields.	Geography & Dev, Sch of	Graduate	MATH 574G STAT 574G
	575	Economic Evaluation of Water and Environmental Policy	Theory and application of economic concepts needed to evaluate water and environmental laws and policies; including benefit cost analysis, externalities, public goods and valuation methodologies. Case studies include federal, state, tribal and international water and environmental policies.	Agriculture & Resource Econ	Graduate	AREC 575 ARL 575 ECON 575 HWRS 575 RNR 575
	576	The Land Development Process	A case-oriented approach to site selection, rezoning, financing, architectural design, economic feasibility, and other facets of the land development process. Graduate-level requirements include the completion of a series of research projects.	Planning	Graduate	PLG 576 RED 576
	576U	The Chinese City: Comparative Perspectives	This course asks how the city was understood and urban space was experienced in China from the late imperial period to the twentieth century, from the walled cities of Ming and Qing to the neoliberal remaking of Beijing and Shanghai, passing through the modernist experiments of the Communist and Republican periods. Examining some of the key social, cultural and political factors that shaped urban life, we will address such questions as: how did changes in media shape conceptions of urban space and one's place within it, what did the Chinese urban landscape look like, what were some of its key features, and how did political changes at the national level affect life and governance in the city? Our investigations will also lead us into the realm of cultural and intellectual history. We will look at how such notions as cosmopolitanism, nation-mindedness, and scientific rationality developed in and around the city. In more general term, we will use the case of China to investigate how a history of "modern urban life" and urban space can be written, and what its significance might be. This course maintains a focus on the distinctive character of various Chinese cities while attempting to elucidate deeper commonalities and similarities that shape urban experience in China and elsewhere. Comparisons with other national experiences as well as theoretical reflections on issues of urbanism and urban life will then be integral part of the course. Graduate level requirements: In addition to the undergraduate assignments, you will have to submit a book review every other week. 3-4 pages in length, double-spaced. (No web posting or short paper when a book review is due). Graduate-level work is expected from graduate students in all assignments.	History	Graduate	CHN 576U HIST 576U
	578	Global Change	Analysis of the Earth system through an examination of its component parts (particularly climate and biogeochemistry) and their interactions with human activities, emphasizing information needed to understand modern and future environmental changes. Graduate-level requirements include an in-depth written exercise and additional activities as described in the syllabus.	Geosciences	Graduate	GC 578 GEOS 578 HWRS 578 RNR 578
	579	Spatial Statistics and Spatial Econometrics	This course provides the statistical and econometric techniques required for the analysis of geocoded data. Identification of spatial heterogeneity and inclusion in a formal regression model. An important aspect of the course is to gain hands-on experience in applying the appropriate techniques and using state-of-the-art software.	Geography & Dev, Sch of	Graduate	ECON 579 PLG 579 STAT 579
	580	Power, Politics and Deforestation in the Brazilian Amazon	This course examines the wide variety of causal explanations for deforestation in the Brazilian Amazon and the policy proposals offered by Latin American and North American political scientists, economists, historians, anthropologists, geographers, ecologists, journalists and environmental activists.	Latin-American Studies, Ctr	Graduate	LAS 580
	583	Geographic Applications of Remote Sensing	Use of aircraft and satellite imagery for monitoring landforms, soils, vegetation and land use, with the focus on problems of land-use planning, resource management and related topics. Graduate-level requirements include the completion of a project report.	Geography & Dev, Sch of	Graduate	ENVS 583 PLG 583 RNR 583
	590	Remote Sensing for the Study of Planet Earth	Remote Sensing for the Study of Planet Earth introduces basic and applied remote sensing science as a means to explore the diversity of our planetary environments (biosphere, atmosphere, lithosphere and hydrosphere) within the radiometric, spectral, spatial, angular and temporal domains of remote sensing systems. This survey course strikes a balance between theory, applications and hands-on labs and assignments. We explore how you can download, process, analyze and interpret multi-sensor data and integrate online remotely sensed data sources/products into your research of interest.	Rem Sens & Spatial Anls, Cmt	Graduate	ARL 590 ATMO 590 ENVS 590 GEOS 590 HWRS 590 MNE 590 OPTI 590 REM 590 RNR 590
	593	Internship	Specialized work on an individual basis, consisting of training and practice in actual service in a technical, business, or governmental establishment.	Geography & Dev, Sch of	Graduate	-
	594	Practicum	The practical application, on an individual basis, of previously studied theory and the collection of data for future theoretical interpretation.	Geography & Dev, Sch of	Graduate	-
	596B	Water Policy in Arizona and Semi-arid Regions	This course focuses on current Arizona water policy from a multi-disciplinary perspective. Through readings, research, lectures, discussions and presentations, the student is exposed to major, current water resource issues facing Arizona and other parts of the West and policies to address them. The faculty draw upon their and guest-lecturers' experiences to demonstrate the development, analysis and implementation of real-world water policy.	Soil, Water, & Environ Science	Graduate	ENVS 596B HWRS 596B LAW 596B PLG 596B
	596I	Comparative and International Water Policy	This course examines major issues in comparative and international water policy, including water markets, privatization, dams and river basin management, environmental flows, social equity, and water governance. The course is interdisciplinary and builds on law, geography, political economy, and institutional economics.	Geography & Dev, Sch of	Graduate	LAW 596I
	596J	Water Management and Policy	Management and policy challenges driven by surface water and groundwater scarcity will be assessed for the Southwest US, Mexico, and globally. Critical review of institutions coupled with assessment of emerging management systems will lead to consideration of policy alternatives.	Geography & Dev, Sch of	Graduate	-
	596L	Law, Geography, and Property	This seminar aims to bring together law, geography, and political economy, where they overlap in matters of nature and environment. Property rights are the central theme. The goals of the course are to bridge the separate worlds of "law-and-society" and environmental studies, and to prepare graduate students to do interdisciplinary legal and policy analysis as part of their academic research.	Geography & Dev, Sch of	Graduate	LAW 596L

Subject Code	Catalog Number	Course Title	Description	Academic Org Desc	Academic Career Desc	Crosslisted courses
GEOG	596M	Making the Connection between Science and Decision Making	This seminar explores concepts at the foundation of the intersection between environmental science and decision, making as well as practical aspects of two-way communication to explore the ways in which exchanges take place between scientists and decision makers.	Geography & Dev, Sch of	Graduate	-
	596U	Interdisciplinary Environment-Behavior-Design	The development and exchange of scholarly information, usually in a small group setting. The scope of work shall consist of research by course registrants, with the exchange of the results of such research through discussion, reports, and/or papers.	Psychology	Graduate	ARC 596U PLG 596U PSY 596U
	597F	Community and School Garden Workshop	This workshop-based course is designed to enable UA undergraduates and graduates students to work in Tucson-area schools helping students and teachers to undertake the design, construction, planting, harvesting and preparation of foods from a local school garden. The workshop also involves preparing or assembling curriculum materials to enable teachers and students to teach and learn about food production, food histories and geographies, and food politics. The course includes an intensive workshop sponsored by the Tucson Community Food Bank. In addition to attending that workshop, students are also expected to attend at least one fieldtrip among the two that are organized during the semester as well as attend monthly meetings of the group on the UA campus. Most of the workshop, however, revolves around consistent and engaged involvement with a Tucson school and its teachers and students supporting the development and maintenance of school garden and attendant curriculum. Graduate-level requirements include a 8-10 page research paper that explores some aspect of wider impacts of community/school gardens. Expectations about this final paper will be provided during the first week of the course.	Geography & Dev, Sch of	Graduate	ENVS 597F LAS 597F NSC 597F PLS 597F STCH 597F TTE 597F
	597S	Sustainable Development and New Urbanism	Examines contemporary competition between environment, resources (water, energy), social equity, and economic viability in the community development and revitalization arena. Public policy, planning initiatives, design strategies and technical solutions that bridge the conflicting agendas are analyzed. Field investigation of contemporary cases. Appropriate for students specializing in planning, architecture and landscape architecture. Graduate-level requirements include a case study paper and formal class presentation. The study should include a literature review, and assessment methodology and critical comment.	Planning	Graduate	PLG 597S RED 597S
	597T	Housing and Households	First of two-course sequence focusing on U.S. housing and community development. Topics covered include housing market projections, housing submarket analysis, housing finance and mortgage lending, household analysis, residential choice and residential mobility. Appropriate for students specializing in urban planning, architecture, urban geography and urban sociology.	Planning	Graduate	PLG 597T
	599	Independent Study	Qualified students working on an individual basis with professors who have agreed to supervise such work. Graduate students doing independent work which cannot be classified as actual research will register for credit under course number 599, 699, or 799.	Geography & Dev, Sch of	Graduate	-
	599G	Supervised Geotechnology Independent Study	Qualified students working on an individual basis with professors who have agreed to supervise such work. Course fee enables access to the School's geotechnology labs. The requirements outlined in the student-faculty contracts will reflect graduate distinctions.	Geography & Dev, Sch of	Graduate	-
	605	Planning Theory	This course shows students how planners frame the notion of public interest in their work, how planning, which is often intervention in the private market, can be justified in a capitalist society, the role that professional ethics play in the life of the planner, and the ways in which various kinds of planners define their job - and then do it. The course includes both the classic work in planning theory and the latest conversations in the theory community but with a strong emphasis on the value of such work for practicing planners.	Planning	Graduate	PLG 605
	611	Projects in Regional Planning	Lectures, laboratory, and field projects covering various aspects of professional practice.	Planning	Graduate	PLG 611
	619	Ecology of Savannas, Shrublands, and Woodlands	[Taught Spring semester in even-numbered years] The functional ecology and dynamics of biogeographically diverse savanna, shrubland and woodland ecosystems will be examined. Interactions among co-occurring life forms and growth forms will be emphasized with in the context of climate, soils and disturbance.	Range Management	Graduate	ARL 619 ECOL 619 ENVS 619 RAM 619
	641	Water Law	The course in Water Law traditionally emphasizes state law rules that govern rights to use surface water and groundwater throughout the country. Although we will give ample attention to the prior appropriation doctrine, riparian water rights, and various systems for regulating groundwater use, this course will also emphasize how federal law may impact water rights. Increasingly, environmentalists and others claim that there are public rights to water that may take precedence over rights under the prior appropriation system.	Law	Graduate	ENVS 641 HWRS 641 LAW 641 MNE 641
	658	Critical Methodological Practice	A critical theory approach to method (primarily qualitative) in human geography and related social sciences; theoretical derivation of research questions; retheorization through research findings.	Geography & Dev, Sch of	Graduate	-
	689	History of Geographic Thought	History of geographic philosophy and methodology.	Geography & Dev, Sch of	Graduate	-
	695A	Current Topics in Geography	The exchange of scholarly information and/or secondary research, usually in a small group setting. Instruction often includes lectures by several different persons. Research projects may or may not be required of course registrants.	Geography & Dev, Sch of	Graduate	-
	695B	Preparing Future Faculty in Geography: Professional Development	A course designed to assist advanced graduate students in obtaining academic employment.	Geography & Dev, Sch of	Graduate	-
	695C	Preparing Future Faculty: College Teaching	Introduces graduate students to pedagogical theory, skills, practice and technological tools for college classrooms. Covers learning philosophies, cognitive skills, assessment, classroom dynamics and ethics. Provides practice in developing and presenting course materials.	Geography & Dev, Sch of	Graduate	-
	695D	Preparing Future Faculty; Writing Workshop/Proposal Development	Course is to assist advance graduate students in writing up a geographic research project or developing a proposal.	Geography & Dev, Sch of	Graduate	-
	696A	Economic Geography	Based on the exchange of information, usually in a small group setting, this course examines contemporary developments in economic geography. The selected topics rotate according to the interests of the faculty convener and the graduate student enrollees. Generally grounded in economic theories of space and place, typical topics include regional inequalities and development; location theory, urban economics, and transportation; marxist and post-marxist political economy; retailing and consumption; alternative economies; resources and agriculture; gender and work; migration and economic change; institutional approaches; the intersection of culture and economy; and money, finance, and trade. The scope of work shall consist of research by course registrants, with the exchange of the results of such research through discussion, reports, and/or papers.	Geography & Dev, Sch of	Graduate	-
	696B	Cultural Geography	Based on the exchange of scholarly information, usually in a small group setting, this course examines contemporary developments in cultural geography. The selected topics rotate according to the interests of the faculty convener and the graduate student enrollees. Generally grounded in cultural theories of space and place, typical topics include transnationalism, globalization, resistance, identity, landscape, postcolonialism, social nature, the body, and media. The scope of work shall consist of research by course registrants, with the exchange of the results of such research through discussion, reports, and/or papers.	Geography & Dev, Sch of	Graduate	-
	696C	Physical Geography	Based on the exchange of scholarly information, usually in a small group setting, this course examines contemporary developments in physical geography. The selected topics rotate according to the interests of the faculty convener and the graduate student enrollees. Generally grounded in theories of biophysical space, typical topics include coupled natural and human systems, ecosystem disturbance and resiliency, energy and mass transfers, measurement and modeling of physical systems. The scope of work shall consist of research by course registrants, with the exchange of the results of such research through discussion, reports, and/or papers.	Geography & Dev, Sch of	Graduate	-
	696F	Advanced Methods and Techniques	Based on the exchange of scholarly information, usually in a small group setting, this course examines contemporary developments in geographic methodology. The selected topics rotate according to the interests of the faculty convener and the graduate student enrollees. Generally following on a base of advanced knowledge in quantitative and/or qualitative methodologies, typical topics include spatial statistics, spatial econometrics, mathematical programming, simulation, ethnography, participant observation, participatory action research, content and discourse analysis, and visual methods. The scope of work shall consist of research by course registrants, with the exchange of the results of such research through discussion, reports, and/or papers.	Geography & Dev, Sch of	Graduate	-
	696G	Urban Geography	Based on the exchange of scholarly information, usually in a small group setting, this course examines contemporary developments in urban geography. The selected topics rotate according to the interests of the faculty convener and the graduate student enrollees. Generally grounded in theories of urban space, typical topics include	Geography & Dev, Sch of	Graduate	-

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GEOG			urban politics and governance, economic restructuring, alternative urbanisms, gender and race, urban subcultures, migration and cities, urban form and the built environment, world cities, and transportation. The scope of work shall consist of research by course registrants, with the exchange of the results of such research through discussion, reports, and/or papers.			
	696H	Political Geography	This course will consist of a seminar format allowing different topics in political geography to be presented. Topics offered will likely include the state, governance, critical geopolitics, social movements, or an exclusive focus on a number of key political/social theorists inside and outside of the discipline of geography from Frederick Ratzel, to Karl Marx to David Harvey.	Geography & Dev, Sch of	Graduate	-
	696I	Political Ecology	This course is a multi-disciplinary approach to understanding resource access by different people, the institutions and environmental conditions through which resource access is mediated, and the sorts of environmental change that these systems may create. It also involves an analysis of the political institutions that have a bearing on environmental outcomes. It frames local resource use systems within the 'nests' of processes that help to shape them - e.g. political economy, globalization, gender relations, and historically produced 'narratives.'	Geography & Dev, Sch of	Graduate	-
	696J	Water Resources Geography	Based on the exchange of scholarly information, usually in a small group setting, this course examines contemporary developments in water resources geography. The selected topics rotate according to the interests of the faculty convener and the graduate student enrollees. Typical topics include water issues in the Western U.S., comparative and international water policy, arid lands, border regions, a warming world, groundwater management, water and urban growth, energy-water linkages, water rights, markets, and transfers, and public and cultural perceptions of water. The scope of work shall consist of research by course registrants, with the exchange of the results of such research through discussion, reports, and/or papers.	Geography & Dev, Sch of	Graduate	-
	696K	Development and the Latin American Experience	The aims of this course are to 1) introduce students to general theories of development from development studies, anthropology, geography and related fields, 2) introduce students to critiques of development practices that have emerged from the Latin American experience, and 3) provide an opportunity for students to compare experiences from their own work (within or outside of Latin America) with the general theories and case studies offered in class.	Latin-American Studies, Ctr	Graduate	LAS 696K
	696L	Conservation and Community	An intensive exploration of the impact of conservation efforts, including protected areas, on rural peoples across the world.	Anthropology, Sch of	Graduate	ANTH 696L HIST 696L
	696M	Geography and Dendrochronology	This graduate-level seminar will focus on a review and discussion of the literature on various topics in dendrochronology. The goal of the seminar is to become familiar with the current body of research on the featured topic, and to critique a set of papers that have appeared in the peer-reviewed literature.	Geography & Dev, Sch of	Graduate	-
	696N	Geography and Social Theory	Based on the exchange of scholarly information, usually in a small group setting, this course examines developments in socio-spatial theory. Selected topics and thinkers will rotate according to the interests of the faculty convener and the graduate students enrolled. Course organization may be historical, e.g., based on a survey of trends in socio-spatial theory, or thematic, e.g., examining the intersection between spatial theory and such topics as politics, resistance, feminism, globalization, etc. The scope of work shall consist of research by course registrants, with the exchange of the results of such research through discussion, reports, and/or papers.	Geography & Dev, Sch of	Graduate	-
	696O	Adaptation & Resilience in Water Resources Systems	Climate change, urban growth, energy demand, and global food trade alter water in coupled human-natural systems. This seminar addresses adaptation and resilience using material on river basins, aquifers, infrastructure, policy, and institutions from Southwest U.S., transboundary U.S.-Mexico, and international cases.	Geography & Dev, Sch of	Graduate	-
	696Q	Participatory Systems Design and Delivery	This seminar is a graduate experience intended to improve the participants' ability to design, deliver and measure the performance of Participatory and Collaborative Systems (PCS) in their own work and research. The seminar covers philosophical considerations of PCS, performs a survey across a range of participatory and collaborative methods, and examines state-of-the-art efforts in PCS across a range of disciplines and application domains using case studies from a range of journals. To the degree possible during the semester, there will be active participation in a mandated public meeting process.	Geography & Dev, Sch of	Graduate	-
	696R	International Environmental Policy	This seminar examines the challenges of understanding and governing environmental change at the international scale. The goal of the seminar is to provide an overview of the major scholars, theories and debates in the governance of international environmental issues such as climate change, land use, oceans, biodiversity, and trans-boundary resources; to critically assess scholarship and policy; and to understand the origins and impacts of international environmental policy in different countries and geographic regions.	Geography & Dev, Sch of	Graduate	-
	699	Independent Study	Qualified students working on an individual basis with professors who have agreed to supervise such work. Graduate students doing independent work which cannot be classified as actual research will register for credit under course number 599, 699, or 799.	Geography & Dev, Sch of	Graduate	-
	900	Research	Individual research, not related to thesis or dissertation preparation, by graduate students.	Geography & Dev, Sch of	Graduate	-
	909	Master's Report	Individual study or special project or formal report thereof submitted in lieu of thesis for certain master's degrees.	Geography & Dev, Sch of	Graduate	-
	910	Thesis	Research for the master's thesis (whether library research, laboratory or field observation or research, artistic creation, or thesis writing). Maximum total credit permitted varies with the major department.	Geography & Dev, Sch of	Graduate	-
	920	Dissertation	Research for the doctoral dissertation (whether library research, laboratory or field observation or research, artistic creation, or dissertation writing).	Geography & Dev, Sch of	Graduate	-