

METROPOLITAN STATE COLLEGE OF DENVER  
Office of Academic Affairs

Program Modifications

SECTION A: PRESENT CATALOG LISTING

Department of  
**Earth and Atmospheric Sciences**

**Geographic Information Systems (GIS) Concentration**

REQUIRED COURSES	SEMESTER HOURS
Required Core	16
CMS 1010 Introduction to Computers	
-or-	
CSS 1010 Introduction to Computers	3
GEG 3610 Principles of Land Use Planning	3
GIS 1710 Terrestrial Navigation	2
GIS 3210 Introduction to Cartography	4
GIS 3250 Computer Cartography	3
GIS 4840 Remote Sensing	3
GIS 4850 Advanced Geographic Information Systems	3
GIS 4860 Applications of ARC/INFO to Natural Resources Management	3
GIS 4870 Spatial Databases Design, Implementation, and Management	3
GIS 4890 Advanced GIS Laboratory (Senior Experience)	3
<i>Total required concentration</i>	30

Because GIS is an application tool, students are required to specialize in an **area of interest**. One of the following interest areas must be selected or one may be designed and approved by a department advisor. Select a minimum of 19 credit hours from one of the following areas, resulting in a major total of 65 hours. Note: other suggestions include the courses comprising minors in Computer Science (School of Letters, Arts and Sciences); Computer Information Systems, General Business, International Business, Marketing (School of Business), and Criminal Justice and Criminology (School of Professional Studies).

**Areas of Interest**

**Environment**

COURSES	SEMESTER HOURS
ENV 1200 Introduction to Environmental Science	3
ENV 3540 Advanced Geologic and Environmental Hazards—Denver and Vicinity	2
ENV 4000 Environmental Geology (required)	3
ENV 4010 Environmental Hazards and Planning	3
ENV 4200 Environmental Policy and Planning	3
ENV 4420 Wetlands	3
ENV 4430 Habitat Planning	2
ENV 4960 Global Environmental Challenges	3
ENV 4970 Environmental Field Studies	3
GEG 4XXX Advanced Seminars, Topics, or Workshops in Geography	1-3
GEL 3150 Hydrogeology	3
GEL 4150 Hydrology	3
<i>Subtotal</i>	19

**Meteorology**

COURSES	SEMESTER HOURS
MTR 2400 Introduction to Atmospheric Science (required)	4
MTR 2410 Weather Observing Systems	3
MTR 3100 Air Pollution	3
MTR 3400 Synoptic Meteorology (required)	4
MTR 3420 Radar and Satellite Meteorology	3
MTR 3500 Hazardous Weather	3
MTR 4210 Forecasting Laboratory I	2
MTR 4440 Climatology	3
MTR 4500 Mesometeorology	3
<i>Subtotal</i>	19

**Planning**

COURSES	SEMESTER HOURS
ENV 1200 Introduction to Environmental Science	3
ENV 4000 Environmental Geology	3
ENV 4010 Environmental Hazards and Planning	3
ENV 4200 Environmental Policy and Planning	3
ENV 4430 Habitat Planning	2

GEG 3610 Principles of Land Use Planning .....	3
GEG 3630 Transportation Planning and Land Use .....	3
GEG 4610 Urban and Regional Planning .....	3
GEG 4620 Residential Land Use Patterns .....	3
GEG 4640 Recreational Land Use Patterns .....	3
GEG 4XXX Advanced Seminars, Topics or Workshops in Geography .....	1-3
<i>Subtotal</i> .....	<i>19</i>

**Resources**

COURSES .....	SEMESTER HOURS
ENV 1400 World Resources .....	3
ENV 3400 Water Resources .....	3
ENV 3620 Population, Resources, and Land Use .....	3
ENV 4960 Global Environmental Challenges .....	3
GEL 3150 Hydrogeology .....	3
GEL 3420 Soil Resources .....	4
GEL 3440 Energy and Mineral Resources .....	4
GEL 4150 Hydrology .....	3
<i>Subtotal</i> .....	<i>19</i>
<i>Major Total</i> .....	<i>65</i>

**CERTIFICATE PROGRAMS AVAILABLE**

Students must complete each course in a certificate program with a grade of “C” or better. The courses cannot be taken pass/fail.

**Geographic Information Systems (GIS)**

The certificate of completion in Geographic Information Systems will provide students and working professionals with the theoretical knowledge and technical and application skills needed to successfully use Geographic Information Systems (GIS), remote sensing, Global Positioning Systems (GPS), and cartography to determine solutions to problems in the management, conservation, and improvement of natural and man-made environments.

In any field related to natural resources, and for many fields related to the administration of man-made environments, education and training in GIS have gone from being specialized skills to being *de facto* requirements. This certificate is designed for professionals who work in those fields, for professionals who analyze human and socio-economic data, and for degree-seeking students interested in anthropology, archaeology, biology, business, civil engineering technology, criminal justice, ecology, economics, environmental science, geography, geology, health sciences, land use planning, and social sciences, as well as other programs.

**Admissions Requirements:**

1. There are no special admission requirements for students seeking GIS certification.
2. All students must take the prerequisite courses or provide evidence of equivalent training and receive an official waiver. The courses that have prerequisites are GIS 2250 and GIS 4840. GIS 4850 and GIS 4890 require upper-division standing or senior standing. All courses can be taken by permission of instructor (the official waiver).

**Completion Requirements:**

All students seeking GIS certification must maintain a 3.0 or above in the certificate program because GIS technology and its applications require a high degree of discipline and commitment.

REQUIRED COURSES .....	SEMESTER HOURS
GIS 1710 Terrestrial Navigation .....	2
GIS 2250 Introduction to Geographic Information Systems .....	3
GIS 3250 Computer Cartography .....	3
GIS 4840 Remote Sensing .....	3
GIS 4850 Advanced Geographic Information Systems .....	3
GIS 4860 Applications of ARC/INFO to Natural Resources Management .....	3
GIS 4870 Spatial Databases Design, Implementation, and Management .....	3
GIS 4890 Advanced GIS Laboratory .....	3
<i>Total credits for certificate</i> .....	<i>23</i>