**NARRATIVE TEMPLATE for a (credit) Certificate of Achievement**

**Geographic Information Systems (GIS) Certificate**

**Item 1. Program Goals and Objectives**

The U.S. Bureau of Labor Statistics has stated that geospatial-based occupations are expected to grow faster than average for all occupations over the coming years, with the need for geographic information being a main source for such growth. The Certificate of Achievement in Geographic Information Systems (GIS) will expand the program and offer an option for students looking to update their geospatial skills and enhance their marketability in the workforce.

In collaboration with industry, the department has developed the program which will offer students the opportunity to learn technical skills that can be applied in a multitude of courses and disciplines, such as crime analysis, architecture, business, and archaeology to name a few.

The goals and objectives for the courses offered to obtain this certificate will give students the basic skills needed to obtain one of several specialized positions. Students will develop competencies that relate to each of these occupations, as illustrated in the table below:

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| **TABLE 1 – Occupations and Job Titles Relevant to Geographic Information Systems (GIS)**  |
| **SOC/O\*NET****Code** | **Title** | **Description** | **Sample of Reported Job Titles** |
| 17-1021    | [Cartographers and Photogrammetrists](https://nam12.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.bls.gov%2Fsoc%2F2018%2Fmajor_groups.htm%23&data=04%7C01%7Cdgolden%40mtsac.edu%7Ced4b3f2618184ec2b14008d9038290e4%7Ccc4d4bf20a9e4240aedea7d1d688f935%7C0%7C0%7C637544681586684376%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C1000&sdata=bUonxTY%2B4lK2UNly0DOll3VO1m3Z605YSOuhlk8LocU%3D&reserved=0) | Research, study, and prepare maps and other spatial data in digital or graphic form for one or more purposes, such as legal, social, political, educational, and design purposes. May work with Geographic Information Systems (GIS). May design and evaluate algorithms, data structures, and user interfaces for GIS and mapping systems. May collect, analyze, and interpret geographic information provided by geodetic surveys, aerial photographs, and satellite data. | Digital Cartographer , Mapper , Topographer |
| 17-3031   | [Surveying and Mapping Technicians](https://nam12.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.bls.gov%2Fsoc%2F2018%2Fmajor_groups.htm%23&data=04%7C01%7Cdgolden%40mtsac.edu%7Ced4b3f2618184ec2b14008d9038290e4%7Ccc4d4bf20a9e4240aedea7d1d688f935%7C0%7C0%7C637544681586674419%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C1000&sdata=n1Fo%2F5y8WKrREe4XkPiCOfUNHAdGGYL8JICLsBS2VSE%3D&reserved=0) | Perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist, to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. May verify accuracy and completeness of maps. Excludes "Cartographers and Photogrammetrists" (17-1021), "Surveyors"" (17-1022), and "Geoscientists, Except Hydrologists and Geographers" (19-2042 | Cartographic Technician , Field Map Technician , GIS Mapping Technician |

The Geographic Information Systems (GIS) certificate involves every aspect of acquiring, processing, integrating, modeling, and analyzing data to make decisions applying spatial analysis methods.

**Student Learning Outcomes for the Geographic Information Systems (GIS) Certificate:**

Many pathways can be realized for students who complete the GIS Certificate, which is designed to prepare students for employment following graduation or for transfer to a four-year institution of higher learning.

Upon completion of the program, students will demonstrate proficiency in spatial data collection and manipulation, spatial data management, spatial analysis and spatial modeling using geospatial technologies.

Upon completion of the program, students will apply cartographic principles of scale, resolution, projection, and data management to solve a geographic problem using geospatial technologies.

Upon completion of the program, students will execute an original GIS project under the supervision of a faculty or professional mentor and demonstrate the ability to communicate project outcomes orally, in writing and graphically.

**Item 2. Catalog Description**

Geospatial technologies, including Geographic Information Systems (GIS), Remote Sensing (RS), and Global Positioning System (GPS), are used to capture, store, manage, analyze and visualize geospatial information related to locations on Earth's surface. These technologies are used to combine various types of geospatial information in a digital environment and are widely used in our daily life, government agencies, in almost every industry.  Through this program students will develop an understanding of the theoretical underpinnings of geospatial technologies and gain the skills needed to construct high-quality applications.

**Item 3. Program Requirements**

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| **TABLE 2 - Certificate of Achievement: Geographic Information Systems (GIS)** |
| **Course ID** | **Title** | **Units** | **Sequence** |
| Geog 9 | Geospatial Concepts |  3 | Yr 1, Fall |
| Geog 10 | Intro to GIS |  3 | Yr 1, Fall |
| Geog 11 | Cartography |  2 | Yr 1, Fall |
| Geog 12 | Geospatial Data Management and Acquisition | 3 | Yr 1, Winter |
| Geog 13 | Spatial Analysis | 3 | Yr 1, Spring |
| Geog 14 | Raster Methods | 3 | Yr 1, Spring |
| Geog 15 | Capstone Portfolio | 3 | Yr 1, Summer |
|  | **Total Required Units:**  |  **20** |

The requirements for the Geographic Information Systems certificate and AS Degree were approved and recommended by the GIS Advisory Committee. Please see the attached minutes (Appendix A)

**Item 4. Master Planning**

One of the college’s missions is to train students for the workforce. GIS does exactly that. A wide variety of businesses and industries collect and utilize data in their everyday operations: sources of raw materials, markets, labor force, all of which have spatial aspect. Depicting data spatially is mapping, and that is what GIS is – “intelligent maps.”

The program consists of seven courses and begins with a Geospatial Concepts course, then progresses to coursework covering GIS, Cartography, Data Management, Spatial Analysis, and Raster Methods. Upon completion of GIS courses students are eligible to enroll in a GIS Capstone Project course. The courses we offer are designed to provide students with the skills and knowledge necessary for entry-level employment.

Our GIS advisory committee convened in 2021 and strongly recommended a certificate as GIS technologies are increasingly being used in a variety of fields. This certificate would serve students who want to gain expertise for their current and/or future job requirements. Upon completion of the Certificate in GIS students would gain proficiency with multiple GIS software programs, knowledge of databases and programming, and skills in cartographic design.

**Student Outcomes**

Student outcome information is based on the TOP code(s) relevant to the occupation group and Los Angeles County.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TOP Code**  | **Program**  | **College**  | **2016-2017 Awards**  | **2017-2018 Awards**  | **2018-2019 Awards**  | **3-Year Award Average**  |
| 2206.10  | Geographic Information Systems  | LA Pierce  | -  | -  | 7  | 2  |
| Rio Hondo  | 28  | 36  | 19  | 28  |
| **LA Subtotal**  | **28**  | **36**  | **26**  | **30**  |
| Cypress  | 1  | 12  | 8  | 7  |
| **OC Subtotal**  | **1**  | **12**  | **8**  | **7**  |
| **Supply Subtotal/Average**  | **29**  | **48**  | **34**  | **37**  |

**Item 5. Enrollment and Completer Projections**

| **Courses** | **2019-2020** |
| --- | --- |
| Course Department Number | Course Title | Annual # Sections | Annual Enrollment Total |
| Geog 9 | Geospatial Concepts | 2 | 60 |
| Geog 10 | Intro to GIS | 1 | 20 |
| Geog 11 | Cartography | 1 | 20 |
| Geog 12 | Geospatial Data Management and Acquisition | 1 | 20 |
| Geog 13 | Spatial Analysis | 1 | 20 |
| Geog 14 | Raster Methods | 1 | 20 |
| Geog 15 | Capstone Portfolio | 1 | 20 |

**Total Completers: 15**

**Item 6. Place of Program in Curriculum/Similar Programs**

Humanities and Social Sciences Division, alongside Geography

No inventory records need to be made inactive or changed in connection with this program. This certificate does not replace any existing programs at the college.

**Item 7. Similar Programs at Other Colleges in Service Area**

Rio Hondo - Certificate of Achievement, LA Pierce College - Certificate of Achievement and AA, Cypress College - Certificate of Achievement