FDA GIS Course of Study

Program Year 1 - GIS 100: Fundamentals of GIS I

Incoming 9th graders; any students who haven't had the course before

- ***Attend Summer Camp*** - All incoming students must attend 2 Day GIS Summer Camp as part of their prerequisites to attend the program.

- ***Initial Technical Assessment*** - This will be a brief technical assessment of the students' skills to better understand their proclivity to technology. The instructor will perform the initial survey to get a baseline understanding of the students' strengths and weaknesses. This survey will be followed up by a similar assessment to track progress mid year and at the completion of the academic term.

- **Introduction to Technical Software**
    a. Google Suite
        i. Students will learn how to use programs found within the Google Suite - Docs, Sheets, Slides, Drive because these will be essential tools that they may use in the tech field.
    b. Microsoft Suite
        i. Students will learn how to use the programs found within the Microsoft (or Office) Suite - Word, Excel, Powerpoint, etc
    c. Writing and Representation
        i. Students will learn how to best explain (in written and/or spoken form) their projects through an example using personal representation - mapping their neighborhood and explaining the unique elements found within
    d. Computer Skills
        i. Data Organization/Management
            - Students will learn how to best organize their data when working on a single or multiple projects and the ease of mind that comes with well labeled and sorted datasets
    e. Finalizing student AGO accounts

- **Introduction to digital maps and storytelling**
    a. Introduction to ArcGIS Online (AGO)
        i. Students will learn the basics of creating a map using AGO and the various tools within the software - Web Maps, Web Apps, Dashboards, Storymaps, etc
    b. Student Storytelling using Digital Maps
        i. Students will use their proficiency in mapping to create a story using their choice/teacher's choice of data and whatever mapping applications they deem appropriate to convey the story found within the data

- **Understanding different types of data & visualizations**
    a. Vector vs. Raster

FDA GIS Course of Study

b. Discrete vs. Continuous

- **Mid Year Interviews** - The Mid Year interview serves as a check-in point for the student and allows the teacher to provide a mid-term exercise or test that can gauge the student's level of understanding in GIS.
    a. The teacher will then deploy another survey 123 to gauge better how students are progressing.

- **Digital Mapping portfolio**
    a. Thorough AGO
        i. Accounts will be kept throughout their school career
        ii. Basic understanding and initial development of portfolio

- *Mental Mapping Exercise* - Students will create hand drawn maps of their neighborhoods or their favorite places. Using markers, pens and trace paper students will draw their locations and then present out to the group.
    a. Skills:
        i. Geographic Thinking
        ii. Map Making
        iii. Public Speaking

- *Creating First Map in AGO* - Students will create their first map in AGO of the City of Detroit using points, lines and polygons.
    a. Skills:
        i. Geographical information systems terminology
        ii. Map making

- **Understanding different types of data & visualizations**
    a. Vector vs. Raster
    b. Discrete vs. Continuous

- *Community Mapping Exercise* - Using ArcGIS Online students will create a map of their local neighborhood. Using data layers from the City of Detroit Open Data Portal and ArcGIS Online students will create a map of their neighborhood using points, lines and polygons. Students will then present their maps to the group and discuss key characteristics about their neighborhood (what can be improved, what works well, what would they change, etc..).
    a. Skills:
        i. Community Research
        ii. Web Map
        iii. Public Speaking

FDA GIS Course of Study

Program Year 2 - GIS 101: Introduction to GIS I
Mainly 10th graders; those with intermediate knowledge

- **Skills Assessment**
    a. Students will be assessed of their current technical needs, mapping skill set, and other applicable skills that are necessary for the current program level
- **Skills Refresher**
    a. Students will be reviewing the skills learned before while also catching other students up to speed on any skills needed for the current program level
- **ArcGIS Pro**
    a. ArcGIS Pro installation and development
    b. Students will develop an understanding of the platform and begin to collect, analyze and interpret data.

- ***Mental Mapping Exercise*** - Students will create hand drawn maps of their neighborhoods or their favorite places. Using markers, pens and trace paper students will draw their locations and then present out to the group.
    a. Skills:
        i. Geographic Thinking
        ii. Map Making
        iii. Public Speaking

- ***Creating Maps in AGO?ArcGIS Pro*** - Students will be creating 3-4 different, digital maps
    a. Multi-Week mapping exercises
        i. Urban Planning
        ii. Ecology & Conservation
        iii. Transportation & Infrastructure
    b. Students will learn how to manage multiple projects with multiple different data found in their AGO accounts
    c. Skills: Geographical information systems terminology, map making

- ***Managing Maps and Data in AGO*** - Students will create their first map in AGO of the City of Detroit using points, lines and polygons.
    a. Skills:
        i. Geographical information systems terminology
        ii. Map making

- **Workforce Preparation** - preparing for summer internships and future workforce introduction after high school
    a. Resume building
    b. Group cooperation
    c. Deadline importance

      d. Mock interviews
          i. Understanding how to properly answer questions in order to sell skills to employer

- **Introduction to Open Data**
    a. Detroit Open Data Portal
    b. Explore, download, create maps
    c. City of Detroit guest speakers

- **Introduction to Drones**
    a. Presentations
        i. Getting started checklist - https://www.faa.gov/uas/getting_started/
    b. Training
        i. Online course (some free tutorials) - https://pilotinstitute.com/course/ultimate-drone-pilot-guide/
    c. Demonstrations - Ohm advisors and work related projects

- **Drone Certification** - Testing for certified drone licenses
    a. Through OHM Advisors

- **City of Detroit project**
    a. Students will undertake a specific project using data collected from the City of Detroit.

- **Participate and help lead incoming students** - be there to answer questions and assist with completing activities

- **Deliver GIS Presentation** - present a project that you developed from the ground up (answering a question, fulfilling a specific need)

Program Year 3 - GIS 201: Fundamentals of GIS Analysis I
11th graders; those willing to teach others and present their work

- **Skills Assessment**
    a. Students will be assessed of their current technical needs, mapping skillset, and other applicable skills that are necessary for the current program level

- **Skills Refresher**
    a. Students will be reviewing the skills learned before while also catching other students up to speed on any skills needed for the current program level

- **GIS Mock Interviews**
    a. Students will fulfill mock interviews which ask GIS/tech related questions in order to get students acquainted with the hiring process of the industry

FDA GIS Course of Study

- **GIS Special presenters/field trips**
  a. Special guest presenters
     i. Guest presenters from across the industry of GIS and GIS related fields will come in and share their experience working with GIS in their respective field
  b. GIS specific job sites
     i. Students will be taken to GIS job sites to introduce them firsthand to the dealings that occur with said jobs

- **Licensing/Certification**
  a. Drone licensing - Arrange study groups and provide materials to help selected students prepare for test
  b. Esri certification classes

- **Internship preparation**
  a. Resume
  b. seeking opportunities
  c. Interview process

- **Deliver GIS Presentation** - present a project that you developed from the ground up (answering a question, fulfilling a specific need)

Program Year 4 - GIS 301: GIS Internship and Certification

Student experts; those serious about the program and/or interested to go farther in the industry
  a. Be leaders: hands on in the development of camp and see it through to completion
  b. Further emphasis on future planning (college/university/trade, career searching, Internship application)

- **ESRI Certification**
  a. Students will gain additional training in order to test for their ESRI Certification
  b. This allows them greater work opportunity after graduation

- **Drone Piloting Training**
  a. Training in through associate programs
- **Resume**
  a. Learn how to best prepare a resume for general use and specific use with GIS industry jobs
  b. Hand in hand with mock interviews and the process of making a good impression in the workforce
- **Hands-On Field Trips/Work-based Learning**
  a. Day trips to different GIS companies
  b. Assistance with larger projects

       c. CoD DoIT projects?
- **Web Mapping project**
    a. All the works on a dataset/topic of student's choice
    b. Including additional presentation materials/marketing post drafts/etc

- **Deliver GIS Capstone Project/Presentation** - present a project that you developed from the ground up (answering a question, fulfilling a specific need)