

REMOTE SENSING

Graduate studies in Remote Sensing involve one or more areas of research using image processing technology, GIS, statistical analysis, and radiometric modeling. These studies are combined with a minor in another area of Civil Engineering, such as Geotechnical, Water Resources, Transportation and/or Environmental Engineering. The graduate program develops a student's ability to acquire and analyze data for purposes of inventory, modeling, engineering, and resource management.

The flagship University computer facility is the Ohio Supercomputer Center, which principally supports research computing. In addition, the department maintains specialized facilities in the College of Engineering Region 1, supported, in part, by a University computer fee. The physical facility consists of 150 PCs. Students have 24-hour, 7 days a week access. Some are available on a walk-in basis; others provide studio settings for advanced users. At least 35 software packages are available, including the Microsoft Office suite, AutoCAD, 3D Studio, ProEngineer, and various GIS and image processing packages. Many faculty also maintain dedicated computer facilities to support specialized research programs.

FACULTY

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MINIMUM REQUIREMENTS

A Master's and Ph.D. degrees are offered in the field of Remote Sensing. In addition to the general requirements of the Graduate School, there are minimum departmental requirements to be fulfilled by all students majoring in Remote Sensing. See the general description in the Graduate Study Civil Engineering brochure for these requirements, which make reference to Tables A and B.

TABLE A

| | | |
|-------|--|---|
| CE806 | Radiometric Measurements and Modeling | 5 |
| CE808 | Integrating Remote Sensing with Engineering Databases | 5 |
| GS828 | Advanced Photogrammetry Applications | 4 |
| GS829 | Advanced Digital Image Acquisition in Photogrammetry | 3 |
| CE830 | Advanced Methods of Processing Digital Imagery in Photogrammetry | 3 |
| CE831 | Advanced Pattern Recognition and Interpretation Methods in Digital Mapping | 3 |

Note: The majority of credit hours must be CE courses.

TABLE B

| | | |
|--------|---|---|
| CE603 | Remote Sensing of Environment | 4 |
| CE604 | Terrain Analysis | 4 |
| CE607 | Fundamentals of GIS | 4 |
| CE608 | Spatial Analysis Techniques in CE | 4 |
| CE610 | Analysis of Natural and Polluted Waters | 3 |
| CE613 | Applied Hydrology | 4 |
| CE651 | Soil Mechanics | 4 |
| CE670 | Urban Public Transportation | 4 |
| CE673 | Highway Location and Design | 4 |
| CE713 | Water Quality and Environ Measurement | 4 |
| CE715 | Water Resource Systems: Water Supply | 5 |
| CE719 | Water Quality Modeling | 4 |
| CE722 | Open Channel Hydraulics | 4 |
| CE723 | Transport Phenomena in Wat Res Engr | 4 |
| CE734 | Structural Analysis/Design for Dynamic Disturbances | 5 |
| CE760 | Civil/Environmental Engineering Planning | 5 |
| CE775 | Urban Transportation Planning | 4 |
| CE797 | Interdepartmental Seminar in Remote Sensing | 3 |
| CE798 | Current Topics in Environmental Science | 1 |
| CRP771 | Application of Quantitative Methods in Urban Planning | 4 |
| GS608 | Introduction to GPS | 3 |
| GS626 | Land Information Management | 4 |
| GS628 | Elements of Analytical Photogrammetry | 4 |
| GS630 | Fund of Computer-assisted Cartography | 4 |
| GS632 | Large Scale/Topographic Mapping | 4 |
| GS633 | Digital Surface Models | 4 |
| GS634 | Digital Mapping Systems | 4 |
| GS636 | Mapping Projections | 4 |
| GS640 | Decision-Making with GIS | 3 |
| GS650 | Adjustment Computations I | 5 |
| GS651 | Adjustment Computations II | 4 |
| GS725 | Photogrammetric Triangulation | 3 |
| GS726 | Photogrammetric Mapping | 4 |
| GS774 | Spectral Method/Raster Geometry in Digital Mapping | 4 |
| GS816 | Environmental Systems Analysis | 5 |
| GS820 | Advanced Hydrology | 5 |
| CE821 | Sediment Transport and Engineering | 4 |
| CE823 | Numerical Models in Water Resources Engineering | 5 |
| CE830 | Earthquake Engineering | 5 |
| CE851 | Advanced Soil Properties | 4 |
| CE853 | Advanced Soil Mechanics | 4 |
| CE874 | Urban Transportation Network Analysis | 5 |

TABLE B continued

| | | |
|---------|---|---|
| GEOG680 | Numerical Cartography | 5 |
| GEOG685 | Intermediate Geographic Info System | 5 |
| GEOG687 | Design/Implementation of Geographic Information | 5 |
| GEOG780 | Analytical Cartography | 5 |
| GEOG785 | Data Input Operations in GIS/Cartography | 5 |
| GEOG787 | Advanced Applications in GIS | 5 |
| GEOL641 | Geostatistics Laboratory | 2 |
| GEOL642 | Geomathematical Methods | 4 |
| NRE725 | Wetland Ecology and Management | 5 |
| NRE760 | Ecosystem Modeling | 5 |
| STAT645 | Applied Regression Analysis | 5 |
| STAT651 | Survey Sampling Methods | 3 |
| STAT661 | Applied Nonparametric Statistics | 5 |
| STAT755 | Multi-variate Analysis I | 3 |
| STAT756 | Multi-variate Analysis II | 3 |
| SU609 | Surveying with Satellites | 3 |
| SU625 | Cadastral Information System | 4 |
| EE707 | Digital Image Processing | 3 |
| EE714 | Radar Systems | 3 |
| EE863 | Computer Vision | 3 |

Note: The majority of credit hours must be CE courses.



For Additional Information, please contact
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<http://www.ceegs.eng.ohio-state.edu>

For application information visit:
www.gradadmissions.osu.edu

Sample Curricular:

A sample MS curriculum is shown below. See the general CE graduate brochure for a specific curricula guide and courses. Plan A curriculum includes 36 course credits, plus an additional 9 credits of research (CE999). Actual student curricula are decided on an individual basis.

| <u>Fall</u> | <u>Winter</u> | <u>Spring</u> |
|--------------|------------------|------------------|
| CE604 (4 cr) | CE603 (4 cr) | CE806/808 (5 cr) |
| CE607 (4 cr) | GEOG685 (4 cr) | CE608 (4 cr) |
| GS608 (3 cr) | Tech Elec (4 cr) | Tech Elec (4 cr) |

GRADUATE STUDY in REMOTE SENSING



THE OHIO STATE UNIVERSITY
Department of Civil & Environmental
Engineering & Geodetic Science



RESEARCH

Research involves the use of remote sensing (RS) and computer-aided techniques for engineering applications. Research topics include geotechnical analysis, water quality evaluations, digital processing of satellite and aircraft data, inventory of coastal and wetland resources, environmental analyses, and use of high resolution data for transportation applications.

FACILITIES

Facilities are available for advanced studies in remote sensing. The Ohio State Remote Sensing Laboratory houses basic equipment for photo interpretation and software for image processing (ERDAS Imagine, PCI Geomatics, ENVI, ERMapper, IDL) and geographic information system (GIS) analysis. Supplemental courses are also offered under Electrical Engineering, Geodetic Science, Geography, Geology, Natural Resources, and Statistics.