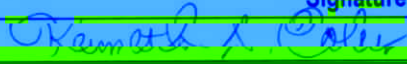





Curriculum Committee Chair(s)	Signature	Date	5. Approvals Department Curric
		3/31/2014	
			
			
			
			

3/31/2014

3/31/2014

3/31/2014

Part II. Description of Curricular Change

1. SYLLABUS OF RECORD

I. Catalog Description

GEOS 313 Hydrogeology

(3 cr, 2L, 4ex)

[REDACTED]

F. Exam 2

(1 hour)

G. Numerical Flow Models

(4 hours)

Application of computer-based finite element and finite difference methods to groundwater

H. Groundwater Monitoring and Sampling

(4 hours)

The attendance policy will conform to IUP's undergraduate course attendance policy.

VII. Required Textbook(s), Supplemental Books and Readings.

Fitts, Charles, 2012, Groundwater Science (2nd Ed.): Academic Press, 692 pp.

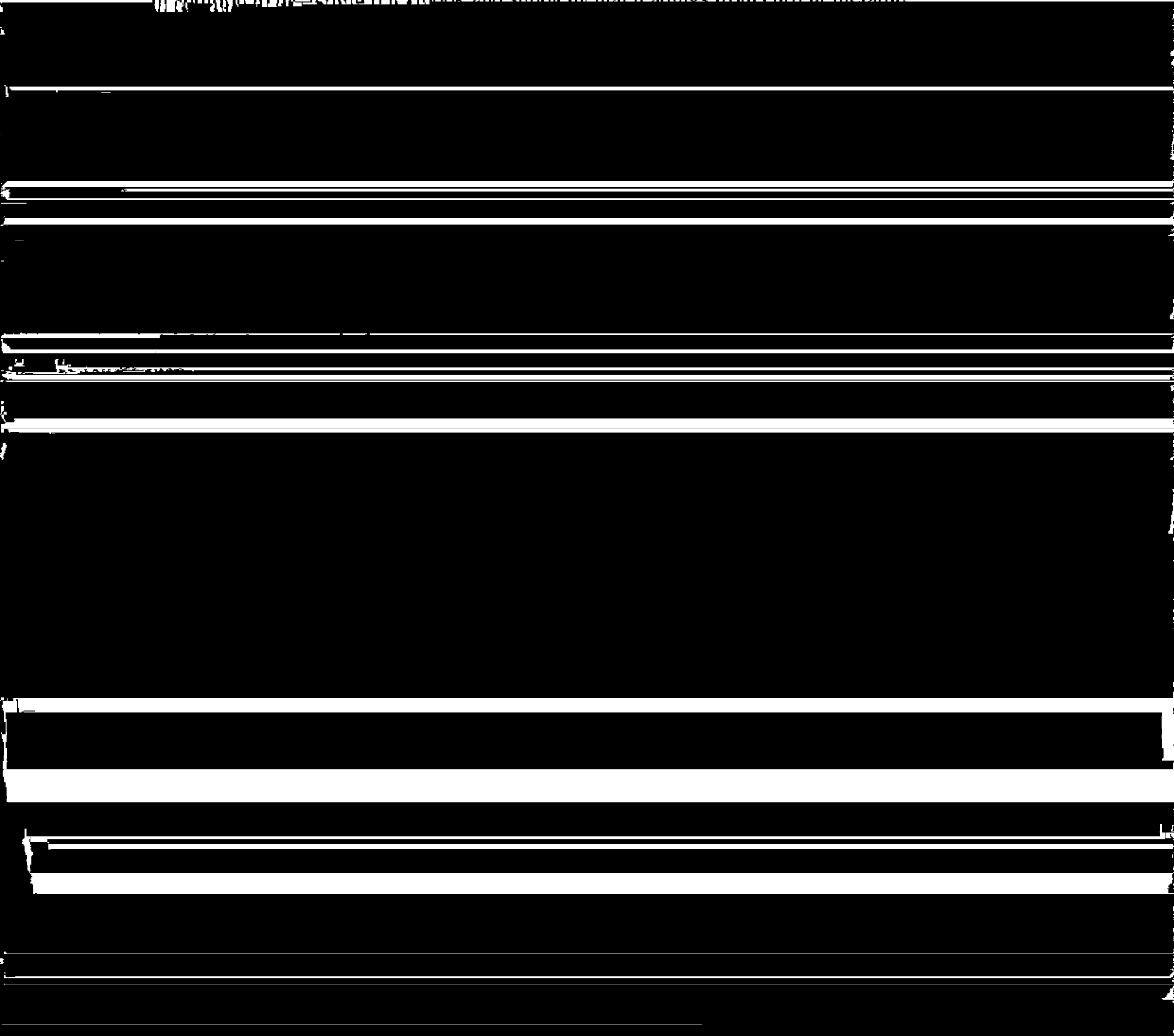
Bair, Scott & Terry Lahm, 2006, Practical Problems in Groundwater Hydrology: Problem-Based Learning Using Excel Worksheets: Prentice Hall, 168 pp.

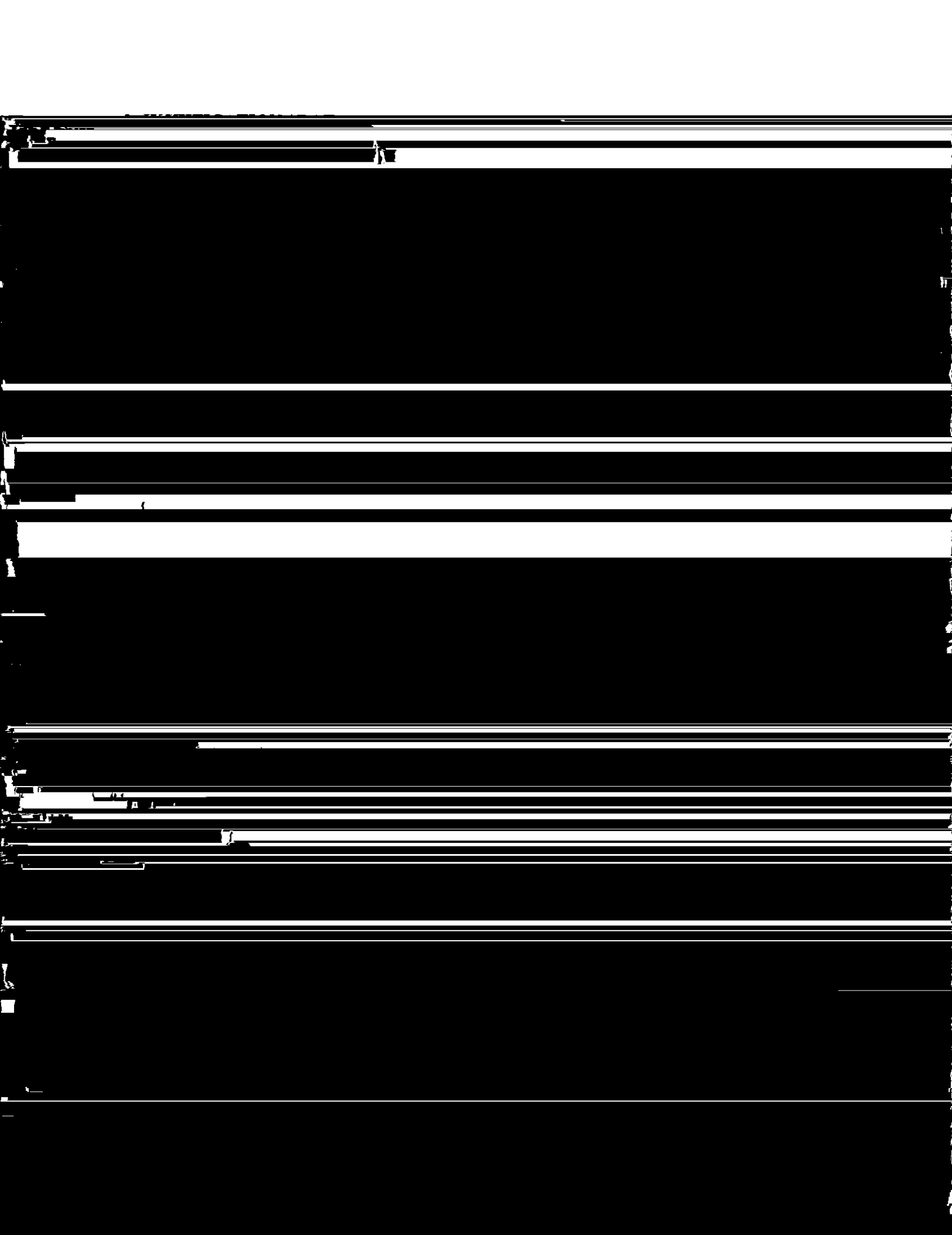
VIII. Special Resource Requirements.

None.

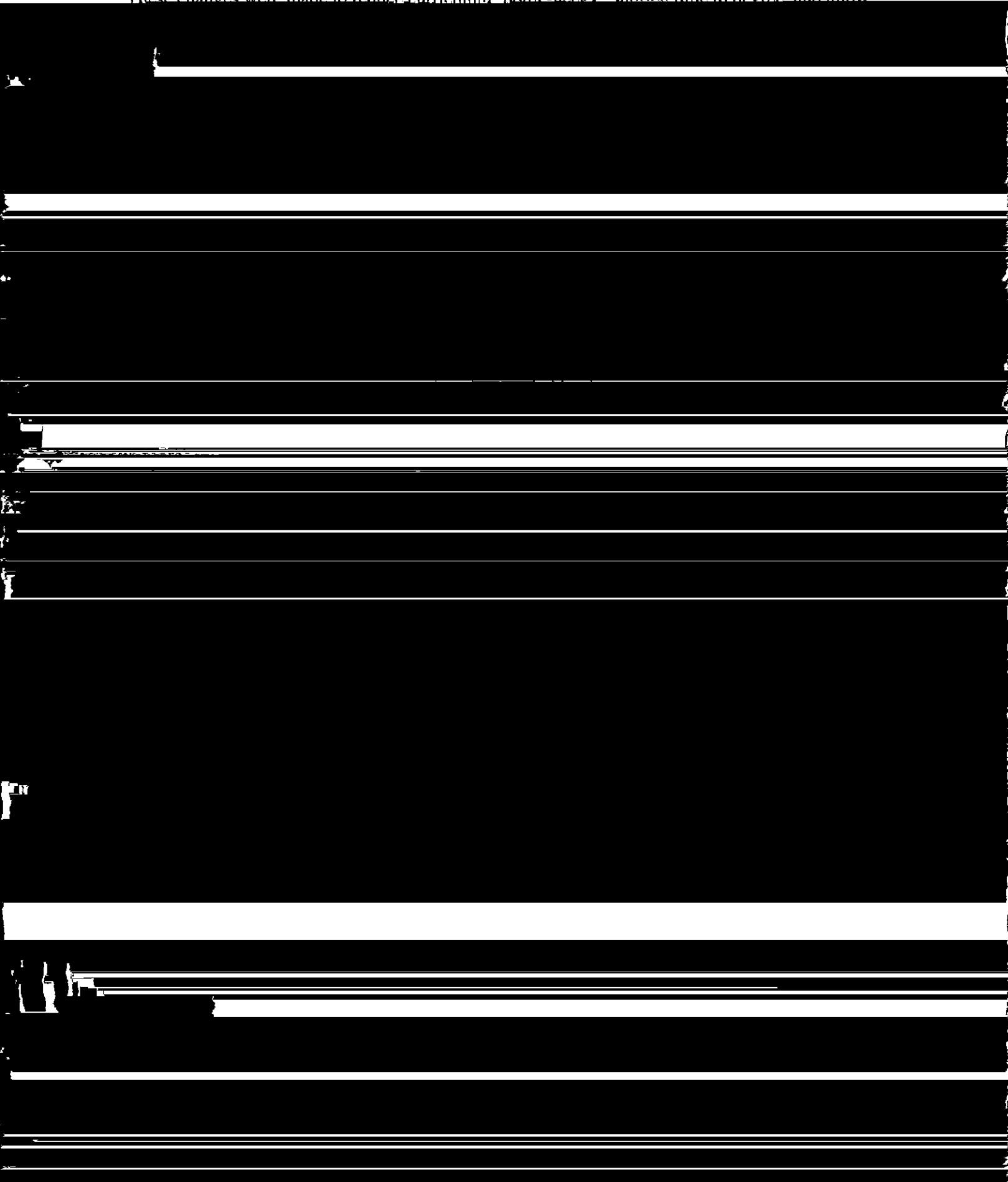
IX. Bibliography

In addition to the required textbook and supplemental readings from current literature





These changes were made to reduce curriculum 'bottle-necks,' shorten time to degree, and allow



FR

PREVIOUS SYLLABUS OF RECORD

I. Catalog Description

GEOS 312 Hydrogeology

3c-01-3cr

Prerequisite: Grade of C or better in GEOS 201 and GEOS 202; MATH 121 or MATH



Predicting Well Flow in Unconfined Aquifers
5. Aquifer Tests (6 academic hours)

Multiple Well Tests
Pump Test Analysis
Pump Tests in the Field
AQTESOLV computer modeling

6. Computer Modeling of Groundwater Flow (3 academic hours)

Steady State & Transient Flow
Numerical Models
MODFLOW computer modeling
Regional Flow Systems

Exam #2 (1 academic hour)

7. Groundwater Remediation (6 academic hours)

Aqueous Pollutants
Non-aqueous Pollutants
Monitoring Wells
Remediation methods
Wellhead Protection
QUICKFLOW computer modeling

8. Groundwater Law and Protection (4 academic hours)

The Pennsylvania Land Recycling Act (Act 4)
The safe landfill program
The Superfund program
Preliminary Site Assessments

9. Applied Topics in Groundwater (3 academic hours)

The attendance policy will conform to IUP's undergraduate course attendance policy.

VII. Required textbooks, supplemental books and readings

Fetter, C.W. *Applied Hydrogeology 4th Edition (with CD-ROM)*. New York: Prentice Hall, 1999.

Bair, S. W. *Practical Problems in Groundwater Hydrology (with CD-ROM)*. New York: Prentice Hall. 2006.

VIII. Special resource requirements

There are no special resource requirements for this course.

IX. Bibliography

In addition to the required textbook and supplemental readings from current literature,