To provide an overview of available book on topics in hydrology, the following books have been placed on reserve at the Morgan Library.


Upon successful completion of this course, the student will be able to:

- Use the principles of linear systems including the instantaneous unit hydrograph to describe, model, and predict the response of streams, reservoirs and basins.
- Route floods through streams and reservoirs.
- Derive the and use the Saint-Venant equations of flow.
- Use kinematic, diffusive, and dynamic wave approximations to describe and route flows on the hillslope and in streams.
- Carry out hydrologic design under uncertainty using hydroeconomic analysis, first order analysis, and advanced first order-second moment analysis of uncertainty.
- Carry out optimal interpolation of hydrologic fields, in particular precipitation, using kriging.
- Derive and implement design storms for hydrologic analysis.
Course Topics/Weekly Schedule:

Week | Topic
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1. | Linear System Theory and Rainfall-Runoff Analysis
2. | Unit hydrograph theory, Instantaneous unit hydrograph (IUH) analysis
3. | Linear channel, Linear reservoir, Nash model
4. | River and Reservoir Flood Routing, Mass curve method, Storage indication method, Puls method, Goodrich method, Coefficient method, Woodward method
5. | Linear Muskingum method, Analytical Solution, Hydraulic analogy, Parameter estimation procedures, Muskingum-Cunge method, Kinematic wave and Overland Flow
6. | Analytical solution - Overland flow problem, Linear and non-linear numerical solutions, Overland Flow with spatially variable infiltration, Routing of diffusive and dynamic waves
7. | Hydrologic Design, Design scale and level
8. | Risk Analysis, Hydroeconomic Analysis, First Order Analysis of uncertainty, Composite Risk Analysis
9. | Risk Analysis of safety factors and safety margins, Hydrologic design under natural and parameter uncertainty, Value of Sample Information
10. | Precipitation data analysis
11. | Precipitation Modeling
12. | Mean Areal Precipitation: Thiessen polygons - Isohyets - IWD Methods, Kriging, Kriging with covariances, Kriging with semivariograms, Co-Kriging, Orographic Influences
13. | Design Storms, Design precipitation depth, Point precipitation, Areal precipitation, Intensity-Duration-Frequency (IDF) Curves
14. | Design Hyetographs, Storm event-based analysis, IDF-based analysis
15. | Estimated Limiting Storms, Frequency analysis

Instructional Methodology: Three lectures per week.

Mode of Delivery: Traditional lectures in class and via the course website for distance students.

Methods of Evaluation: The course grade will be based on the following distribution:

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<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Homework</td>
<td>25%</td>
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<td>Two Exams</td>
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<tr>
<td>Final Exam</td>
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