

Fall 2021

Principles of Water Resources (Graduate Student Course)

Jason A. Hubbart

West Virginia University, jason.hubbart@mail.wvu.edu

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Environmental, Soils, and Water Sciences (ESWS 525)

Principles of Water Resources (3cr)

Course Syllabus and Schedule

Course Purpose

This course will provide students an opportunity to increase their knowledge of the role that water plays in human and environmental systems by examining the cycling and spatiotemporal distribution of water, exploring the importance of water to biological processes, and investigating the mechanisms by which water shapes human use of the land. Students will gain an appreciation for the analysis of the geographic distribution/redistribution, quantity, and quality of water resources, and will be introduced to water management evaluation policies, law and economics used to explore the decision-making challenges surrounding water resources.

Curriculum Based Rationale

No course exists at WVU for graduate level students interested in gaining a broad comprehension of water resources without delving into the calculus and physics of studies in physical hydrology. In addition, few graduate level hydrology courses provide integrated training in water science, policy, and management; yet, graduates are often required to have interdisciplinary expertise in these areas to solve critical contemporary problems facing society. Principles of Water Resources is a general and conceptual water resources course that introduces graduate students to water availability issues, water law, policy, economics, and other topics, and consequently serves the broader community of University educators by providing an introductory graduate course in water resources. This course thus prepares graduate students for future professional positions that will increasingly be integrated with issues of water.

Relative to ESWS 325, the undergraduate counterpart to this course, and consistent with graduate student standing, students will be expected to do additional reading and / or homework assignments, answer additional quiz/test questions, and work at a higher level of proficiency.

Expected Learning Outcomes

By the end of the course, graduate students will be able to:

- Critically explain the cause and effect relationship between human activities and water quality/quantity problems.
- Explain conceptually, and quantitatively the importance and availability of water.
- Describe the cycling and spatio-temporal distributions of water.
- Explain water management issues at the local, regional and national levels, including complexities arising from multiple uses and perspectives.
- Critically analyze and provide examples of issues and concepts related to water policy, management and planning.
- Explain how natural resources information is collected and how it can best be used to facilitate decision-making.
- Critically describe the benefits of incorporating sustainability practices in resource management.

Textbook

Even though there is a 4th edition of our book, so that I can provide it free of charge to you, we will use the 3rd edition:

Thomas V. Cech. 2010. Principles of Water Resources, History, Development, Management, and Policy, 3rd Edition. John Wiley & Sons, Inc. ISBN: 978-0-470-13631-7

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Chapters (electronic, .pdf) will be provided in each of the Weekly modules.

For Access to Course Materials

You may access the course via eCampus <https://ecampus.wvu.edu/webapps/login/>. You can access Blackboard under the My Courses tab. If you have difficulty logging in to the course or you do not see the course listed, please consult the eCampus information page (Support Website).

Library Resources and E-Res

This course may use resources and materials accessible via the Course Reserves system <https://reserves.lib.wvu.edu/> of the West Virginia University Libraries system <https://lib.wvu.edu/>.

Instructor Information

Professor	Co-Instructor or Teaching Assistant
Dr. Jason A. Hubbard	To Be Determined
Office: Agr. Sci. 3109	Office:
Office Phone: 304-293-2472	Office Phone: 
Email: jason.hubbart@mail.wvu.edu	Email:
Office Hour: M,W,F: 9am-10am (ET)	Office Hour:

Expectations

- **Meeting Location and Time:** This course will be administered online via the World Wide Web and is asynchronous, meaning there are no formal meeting times. This is important because it also means you can tune in and work on the course requirements any time that best fits your schedule.
- **What You May Expect from the Instructor and/or Co-Instructor** - Monitor and facilitate discussion board assignments, respond to private questions within 24 to 48 hours, provide timely feedback on written assignments and projects, and help facilitate a gainful learning environment.
- **Assignments and Tests**
 - **Other Reading:** There may be assigned readings from other sources throughout the semester that will be provided via the lecture slides (module) a course website, Blackboard, handouts, or other venue(s). To be announced.
 - **Assignments:** Assignments will consist of Discussion Board Assignments, and qualitative, numerical, data analysis, and critical thought exercises and/or questions provided at the end of each chapter. Students may work together, but **all work must be your own**. Please organize your answers and prepare your work **neatly**. Unprofessional and/or messy assignments will not be graded and will receive a score of zero. Be sure to double-check your work. Assignments are due by midnight on the due date and can be submitted via blackboard submission system.

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- **Quizzes:** Quizzes will be administered via blackboard, covering the most recent module.
- **Test:** There will be a final exam. The final exam will be administered via blackboard. The final exam will be cumulative, and may include true/false, multiple choice, short answer, critical thought and computational questions.
- Graduate students may be required to answer additional questions on quizzes and tests, critique peer reviewed articles, and in general will be expected to supply graduate student level analyses and synthesis of assignments, discussions, and semester projects.

Weekly Schedule, Assignments and Quizzes

Your weekly routine: Every week, you should expect to login to the course site (Blackboard) no fewer than 2-3 times. Each week of the course will have a corresponding instructional unit (or module) which may include additional assigned reading, instructor commentary, weekly discussion questions or other materials as assigned. You should complete your readings and review of course materials in advance to stay current with the rest of the class and not fall behind in the course. Each week students will have a reading assignment, Discussion Board assignment and a quiz.

Assignments and Grading Criteria

Graded material will consist of quizzes distributed throughout the semester (see below for grading, and for tentative schedule), all of which carry equal weight and cover most recent material. Additional graded material may include homework, discussion board, or other assignments. Collective graded material will be weighted (as per the grading scale).

Assignments: Assignments will be administered via Discussion Board (see weekly Module Guide) but may also consist of conceptual, numerical, data analysis, and /or critical thought exercises. Students may work together, but all work handed in must be your own. Organize your answers and prepare your work neatly. Unprofessional and/or messy assignments will not be graded and will receive a score of zero. Be sure to double-check your work. Assignments are to be submitted via Blackboard.

Quizzes: Quizzes are intended to assess your comprehension of current material and motivate you to stay current with course material. Subject to modification, quizzes will be available on Blackboard for 48hrs from 12:00am to 11:59pm (00:00hrs to 23:59hrs) the day before and the day of the scheduled quiz. You **MUST** take the quiz during that 48hr window of opportunity. Quizzes are timed and you will have up to 30 minutes (time allowed may vary between quizzes) to complete 10 (± 5) questions. Misspelled words will constitute incorrect answers (i.e. watch your spelling if you want credit). You may take the quiz only once. The following are key considerations to successfully completing a quiz:

- Complete all assigned readings (textbook, articles, unit commentary, lectures, etc.) prior to accessing the online quiz.
- Force completion is turned ON: you must complete the quiz once you start it – you may **NOT** come back to the quiz later. If you are disconnected, send an email to your instructor(s) immediately. After contacting your instructor, please send an email to

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eCampus / Blackboard IT, with your name, username, course name, the title of the quiz or assignment, and a description of the problem (and/or any other pertinent information).

- To ensure Blackboard logs every answer, click "Save" at the bottom of the page every two or three questions. You must click "Submit" in order to have your quiz graded.

Note: Fall 2020 Accommodation for COVID-19:

Within the first 2-3 weeks of the semester, all Quizzes and Discussion Board assignments for the semester will become available to you. You MUST be sure to complete all Quizzes and Discussion Board assignments by the due date on the schedule. This course modification will allow you to work ahead and thus complete the course earlier than the end of the semester. Likewise, the last test of the semester (i.e. final test) will be made available to students before Thanksgiving Break, thereby allowing students to complete the course before Thanksgiving. Just as for other assignments, the final test will be available to you until the scheduled date/time. Other modifications may be made during this course to better suit and accommodate changes to status of the pandemic and to most appropriately meet associated needs.

Grading Criteria for Discussion Board Assignments

Discussion Board posting will consist of questions originating from current material in the textbook. **All** students in the course are expected to participate in the Discussion Board, addressing specific questions presented by your instructor. When no specific questions are presented, the default questions are to take a scenario from your reading and discuss, 1) what is the problem, 2) how was it addressed, 3) what was the outcome, and 4) how could it have been addressed differently?

Discussion Board assignments will be assessed using the following basic criteria (below). You will be required to read and respond on the Discussion Board to postings within a week of the assignment being posted. You are encouraged to respond to comments of other students and continue dialogue pertaining to the assignment. Note: discussions outside course material or the scope of the discussion board articles may result in loss of points.

The material in this course is introductory; however, graduate students are expected to learn to read and digest technical literature in addition to the required text. If you are having trouble with the readings, you are probably not alone, so talk to your classmates or set up an appointment to meet with your instructor.

The following rubric assesses the *quality* of your postings and not the *quantity*. I am not looking for "good idea" or "neat", but rather thoughtful analysis and synthesis within the context of the issue(s) detailed in the topic. This is your opportunity to learn about current issues in water resources and join a broader community of learners.

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Weekly Discussion Posting Grading Criteria	Point Value (50)
Meaningful and New Ideas: Ideas examine topic from new perspective that contributes to group understanding of topic. Completely addresses questions.	20
Message Coherence: Messages explain issues, provide new perspectives, effectively question, or meaningfully elaborate on topic	15
Relevance of Replies to Other Messages: Communicates (interacts) with at least one other student in the Discussion Board. Responses elaborate, contradict, modify, or explain the original message	15

Course Grading Scale

Percent of Total Grade	%	Numeric Grade	Letter Grade
Assignments (Discussion)	50	90+	A
Quizzes	45	70-79	C
Final Test	5	60-69	F
		Below 60	F

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Tentative Course Schedule

Month/Day	Subject	Reading	Due
8/24		Chapter 1	
8/26	Course Introduction, Syllabus, Water History		
8/28	Water History and Development		Q1, HWK1
8/31	Hydrologic Cycle and Climate	Chapter 2	
9/2	Hydrologic Cycle and Climate		
9/4	Watersheds	Chapter 3	Q2, HWK2
9/7	Experimental Watershed Studies		
9/9	Water Monitoring		
9/11	Floods		Q3, HWK3
9/14	Groundwater	Chapter 4	
9/16	Groundwater Hydraulics		
9/18	Understanding the Clean Water Act		Q4, HWK4
9/21	Water Quality Basics	Chapter 5	
9/23	Inorganic and Organic Chemicals		
9/25	Water Quality Management (AMD)		Q5, HWK5
9/28	Water Quality Management (Riparian)		
9/30	Water for Municipalities	Chapter 6	
10/2	Water for Irrigation		Q6, HWK6
10/5	Hydropower, Dams and Reservoirs	Chapter 7	
10/7	Hydropower, Dams and Reservoirs		
10/9	Hydropower, Dams and Reservoirs		Q7, HWK7
10/12	Water Allocation Law History	Chapter 8	
10/14	Water Allocation Law History		
10/16	Water Allocation Rivers		Q8, HWK8
10/19	Water Allocation Groundwater		
10/21	Federal Water Agencies	Chapter 9	
10/23	Federal Water Agencies		Q9, HWK9
10/26	Local Water Agencies	Chapter 10	
10/28	Regional Water Agencies		
10/30	State / Multistate Water Agencies		Q10, HWK10
11/2	Drinking Water Treatment (History)	Chapter 11	
11/4	Drinking Water Treatment Processes		
11/6	Wastewater Treatment Processes		Q11, HWK11
11/9	Water and Fish	Chapter 12	
11/11	Water and Wildlife		
11/13	Water and Physical Habitat		Q12, HWK12
11/16	Water Economics	Chapter 13	
11/18	Water Economics		
11/20	Water Use Conflicts	Chapter 14	Q13, HWK13
11/23	Water Use Conflicts		
11/25	Thanksgiving Break - Fall Recess		
11/27	Thanksgiving Break - Fall Recess		Q14, HWK14
11/30	Emerging Water Issues	Chapter 15	
12/2	Emerging Water Issues		
12/4	Emerging Water Issues		Q15, HWK15
12/7	Final Exam Week (Exam Date TBD)		FINAL TEST
12/9	Final Exam Week (Exam Date TBD)		
12/11	Final Exam Week (Exam Date TBD)		

Q = Quiz; HWK = Homework (Due 12pm); TBD = To Be Determined

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E-Mail Etiquette

E-mail is a very efficient way to communicate. The advantages are obvious: E-mail is fast and free. However, these advantages make it tempting to be less than professional when sending an e-mail to a contact, employer, or faculty member. The informality, brevity, and grammatical "freedom" of a text-style message may not be appreciated by everyone, particularly faculty and employers. Therefore, make it a habit to communicate professionally! Here is how:

1. All messages should have a concise and descriptive subject line. The purpose of the subject line is to alert the reader as to the content of the message.
2. Begin with a salutation. For example, if you are e-mailing a professor, it would be appropriate to begin your e-mail with "Dear Dr. Smith" or "Professor Smith" or even "Ms. Smith." If you typically call Dr. Smith "Pat", then go ahead and begin the e-mail with "Pat." If you are unsure of how to address a professor, "Professor Smith" is the best choice.
3. Utilize traditional rules of grammar, spelling, and punctuation in your message. Use spell check but also remember to proofread the message yourself as spell check won't catch everything.
4. Avoid abbreviations associated with texting. Remember, not everyone understands texting lingo...and if you are writing to professionals, chances are good that you are addressing one of the "more experienced" generations who text less frequently.
5. Close your message with a signature. Be certain that you have included your full name and, if appropriate, some context as to the nature of your relationship with that individual. For example, you might share your major, the fact that you are in a specific class, or that you are an officer in a club.

Example:

(Dear) Dr./Prof. ...,

Your message: in spell-checked, complete and grammatically correct sentences.

(Sincerely/Thank you,)

First name (last name)

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Keeping in Touch

For questions pertaining to the course content, please utilize the "Ask Your Instructor" forum, this allows other classmates to benefit from the response. If you have personal questions about your grade, attendance, etc., please send me a private message using "course messages (internal)". In the event there are any emergencies that may require that you be absent from the course for more than 4 consecutive days, please contact me in advance. If you are unable to contact me directly, please have someone send me an e-mail to jason.hubbart@mail.wvu.edu

More of What You Can Expect from Me

I am available from 9 a.m. – 5 p.m. on most weekdays. If these times are not convenient for you, please let me know. I will be happy to accommodate your schedule if possible.

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When sending an inquiry (course room message or private email) please allow at least 24 hours for a response. Assignments and discussions will be graded within 72 hours whenever possible.

I welcome all questions and feedback, my goal is to help you be successful throughout this course, and I am positive we can accomplish this goal by working together by following the expectations as outlined above.

Confirmation of Expectations

After you have read through and understand these expectations and those of the course syllabus, please respond to the Discussion Board for 10 free points!

Welcome to ENVP – 325 / 525 – Principles of Water Resources!

Thank you and enjoy the course.
Dr. Hubbart

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WVU Academic Policies and Syllabus Statements

Academic policies presented here are those that are at the institutional level and exist in the WVU Catalog. Syllabus statements are Faculty Senate approved and provide guidance to students in negotiating other aspects of course experience. Students are responsible for reviewing and understanding these policies.

Academic Integrity Statement

The integrity of the classes offered by any academic institution solidifies the foundation of its mission and cannot be sacrificed to expediency, ignorance, or blatant fraud. Therefore, instructors will enforce rigorous standards of academic integrity in all aspects and assignments of their courses. For the detailed policy of West Virginia University regarding the definitions of acts considered to fall under academic dishonesty and possible ensuing sanctions, please see the West Virginia University [Academic Standards Policy](#). Should you have any questions about possibly improper research citations or references, or any other activity that may be interpreted as an attempt at academic dishonesty, please see your instructor before the assignment is due to discuss the matter.

Academic Standards Policy, including Academic Dishonesty

The WVU Catalog contains the full [Undergraduate Academic Standards Policy](#) and [Graduate Academic and Professional Standards Policy](#).

- [Resources for Faculty and Students for Reporting and Appealing Violations of Academic Standards](#)

Adverse Weather Statement

In the event of inclement or threatening weather, everyone should use his or her best judgment regarding travel to and from campus. Safety should be the main concern. If you cannot get to class because of adverse weather conditions, you should contact your instructor as soon as possible. Similarly, if your instructor(s) are unable to reach the class location, they will notify you of any cancellation or change as soon as possible, using agreed upon methods to prevent students from embarking on any unnecessary travel. If you cannot get to class because of weather conditions, instructors will make allowances relative to required attendance policies, as well as any scheduled tests, quizzes, or other assessments. [adopted 9-8-2014]

Appropriate Use of Technology Statement

Use of technology in the classroom should always be directly related to class activities and/or course learning outcomes. Inappropriate technology use can be an impediment to learning and a distraction to all members of the class. As such, inappropriate use of technology in the classroom may be considered a disruption of the class and constitute a violation of the [WVU Student Conduct Code](#) and could potentially result in a referral to the Office of Student Conduct. Use of technology in the classroom when specifically prohibited by the instructor may also constitute a violation of WVU's [Academic Integrity](#) policy.

Attendance Policy

The WVU Catalog contains the full [Attendance Policy](#).

Campus Safety Statement

The WVU Police are committed to creating and maintaining a safe learning environment for all students, faculty, and staff. Part of this mission includes educating the campus community on how to respond to potential campus threats, such as the threat of an active shooter on campus or other suspicious behaviors. Fortunately, WVU Police offer training - both online and in-person - on how to handle a variety of campus safety scenarios. All students are encouraged to visit the [WVU Police](#) webpage, in particular the content under the [Active Shooter](#) training program. Students are also encouraged to report any suspicious behaviors on campus using the [Report a Threat](#) portion of the webpage. Additional materials on campus safety prepared by WVU Police, including special safety tips and training, will also be provided on our eCampus page. [adopted 10-2-17]

COVID-19 Syllabus Statement

WVU is committed to maintaining a safe learning environment for all students, faculty, and staff. Should campus operations change because of health concerns related to the COVID-19 pandemic, it is possible that this course will move to a fully online delivery format. If that occurs, students will be advised of technical and/or equipment requirements, including remote proctoring software.

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In a face-to-face environment, our commitment to safety requires students, staff, and instructors to observe the social distancing and personal protective equipment (PPE) guidelines set by the University at all times. While in class, students will sit in assigned seats when applicable and wear the required PPE. Should a student forget to bring the required PPE, PPE will be available in the building for students to acquire. Students who fail to comply will be dismissed from the classroom for the class period and may be referred to the Office of Student Conduct for further sanctions. If a student becomes sick or is required to quarantine during the semester, they should notify the instructor. The student should work with the instructor to develop a plan to receive the necessary course content, activities, and assessments to complete the course learning outcomes.

Inclusivity Statement

The West Virginia University community is committed to creating and fostering a positive learning and working environment based on open communication, mutual respect, and inclusion.

If you are a person with a disability and anticipate needing any type of accommodation in order to participate in your classes, please advise your instructors and make appropriate arrangements with [the Office of Accessibility Services](https://accessibilityservices.wvu.edu/). (<https://accessibilityservices.wvu.edu/>)

More information is available at the [Division of Diversity, Equity, and Inclusion](https://diversity.wvu.edu/) (<https://diversity.wvu.edu/>) as well. [adopted 2-11-2013]

Incomplete Policy

The WVU Catalog contains the full [Incomplete Policy](#).

Sale of Course Material Statement

All course materials, including lectures, class notes, quizzes, exams, handouts, presentations, and other course materials provided to students for their courses are protected intellectual property. As such, the unauthorized purchase or sale of these materials may result in disciplinary sanctions under the [Student Conduct Code](https://studentconduct.wvu.edu/campus-student-code). (<https://studentconduct.wvu.edu/campus-student-code>) [adopted 5-11-2015]

Sexual Misconduct Statement

West Virginia University does not tolerate sexual misconduct, including harassment, stalking, sexual assault, sexual exploitation, or relationship violence [[BOG Rule 1.6](#)]. It is important for you to know that there are resources available if you or someone you know needs assistance. You may speak to a member of university administration, faculty, or staff; keep in mind that they have an obligation to report the incident to the [Title IX Coordinator](#).

If you want to speak to someone who is permitted to keep your disclosure confidential, please seek assistance from the [Carruth Center](#), 304-293-9355 or 304-293-4431 (24-hour hotline), and locally within the community at the [Rape and Domestic Violence Information Center](#) (RDVIC), 304- 292-5100 or 304-292-4431 (24-hour hotline).

For students at WVU-Beckley, contact the [Women's Resource Center](#) at 304-255-1585 (toll free at 1-888-825-7836) or [REACH](#) at 304-340-3676. For students at WVU-Keyser, contact the WVU-Keyser [Psychological Counseling Services Office](#) at 304-788-6976, and locally in Keyser, the [Family Crisis Center](#), 304-788-6061 or 1-800-698-1240 (24-hour hotline).

For more information, please consult [WVU's Title IX Office](https://titleix.wvu.edu/resources-offices) (<https://titleix.wvu.edu/resources-offices>).

Student Evaluation of Instruction Statement

Effective teaching is a primary mission of West Virginia University. Student evaluation of instruction provides the university and the instructor with feedback about your experiences in the course for review and course improvement. Your participation in the evaluation of course instruction is both strongly encouraged and highly valued. Results are strictly confidential, anonymous, and not available to the instructor until after final grades are released by Admissions and Records. Information about how you can complete this evaluation will be provided by your instructor. [adopted 4-14-2008]