Mt. San Jacinto College
Integrated Course Outline of Record

Form B

Submitted by: Melita Caldwell-Betties **Date:** 12/17/2020

Department	Subject	Course Number	Title
Water Technology	Water Technology WATR	537	Introduction to Water Utility Management

Units/Hours

Each lecture unit requires 1 hour per week of class time, and 2 hours per week of study outside of class.
Each laboratory unit requires 3 hours per week of class time.
Each activity unit requires 2 hours per week of class time and 1 hour per week of study outside of class.

Lecture Units	Total Units
3.00	3.00
Lecture Contact Hours	**Total Contact Hours**
48.00 - 54.00	48.00 - 54.00
Lecture Homework Hours	
96.00 - 108.00	

Stand Alone:

Program Applicable

AA/AS Degree General Ed Breadth Area(s):

-none-

General Education Justification:

Maximum Enrollment: 40

Maximum Enrollment Justification: Justification:

Grading Method: Letter Grade or P/NP

TOP code: 0958.00*

Can be Taken 1 **time(s) for credit** (max 4)

- Visual or Performing Arts course that is required to meet major requirements for UC/CSU
- Intercollegiate athletics course
- Academic/vocational competition course

Catalog Description:

(Please do not refer to transferability or degree, certificate, or employment concentration applicability. Please only describe the course).
(**75 words** or less in gray box below).

This course is designed for students interested in managing water and/or wastewater utilities. Topics will include personnel management, organizational management, financial management, training, problem-solving/decision-making, regulatory compliance, health and safety programs, community relations, personal and professional skills.

Schedule Description:

(Please do not refer to transferability or degree, certificate, or employment concentration applicability. Please only describe the course).
(**25 words** or less in gray box below).

This course is designed for students interested in managing water and/or wastewater utilities.

Need for the course:

The safe operation of the nation's water utilities depends on access to a qualified workforce, particularly certified water operators. Industry reports have cited high rates of retirement eligibility and raised concerns about the water industry's ability to fill job openings. Understandably, many water agencies are preparing for the pending wave of retiring utility managers with succession planning. This course is designed to assist water agencies in accomplishing this task by offering a training vehicle for future leaders to ensure each utility continues to retain strong leadership and operational competency well into the future. This course is an elective in the Water Technology degree/certificate as well as the Environmental Studies: Water and Soil Technologies/Environmental Engineering Emphasis degree.

Prerequisite(s):

Prerequisites go through a separate approval process. See Forms E1-E6 for details.
(For further clarification, contact the Prerequisite Subcommittee)

- WATR 530 with a Grade of C or better. and
- WATR 509 with a Grade of C or better. or
- WATR 505 with a Grade of C or better. or
- WATR 522 with a Grade of C or better.

Corequisite(s):

Corequisites go through a separate approval process. See Forms E1-E6 for details.

- WATR 509 or
- WATR 505 or
- WATR 522

Recommend Preparation:

Recommended Preparation goes through a separate approval process. See Forms E1-E6 for details.

-none-

Other Enrollment Criteria:

-none-

Learning Objectives:

(please number each objective and express in behavioral terms)
Upon the completion of the course the student will be able to do the following:

1. Analyze the main elements of a utility manager's job.
2. Relate management's primary responsibilities with regard to operating a water or wastewater utility.
3. Formulate a workforce plan for a utility.
4. Generalize the benefits of short-term planning, long-term and emergency planning to fulfill the mission of the utility.
5. Categorize the major factors that affect the design of water and wastewater facilities.
6. Illustrate a manager's responsibilities regarding the financial management of a utility.
7. Differentiate public relations, media relations, and political relations.
8. Compare the personal and professional skills a utility manager needs to physically and emotionally survive.

Course Content:

(please number the outline of main topics and subtopics)

1. Supervisory Skills
    1. Building the framework
        1. Work planning
        2. Strategic planning
        3. Workforce planning
    2. Organizing
    3. Staffing
        1. Recruiting and selecting candidates
        2. Workforce diversity
    4. Directing
    5. Coordinating
    6. Reporting
    7. Budgeting
    8. Other aspects of a supervisor or utility manager's job
2. Communication
    1. Fundamentals of communication
    2. Types of communication media
    3. Communication skills
        1. Effective listening
        2. Reading
        3. Written communication
3. General business writing
    1. Reports
    2. Technical papers-oral communication
4. Human relations
    1. Working with people
    2. Management styles
    3. The changing workforce
        1. Women in the workforce
        2. The aging workforce
        3. Workforce diversity
        4. Working in teams
5. Planning and organizing
    1. Setting goals and objectives
        1. Mission
        2. Vision
        3. Core values
    2. Setting priorities
    3. Time management

6. Effective work scheduling
    1. Preventative maintenance
    2. Sampling and analysis plan
    3. Environmental management system (EMS)
    4. Contracting and contract management (outsourcing)
7. Training and certification
    1. Conducting a needs assessment
    2. Training program considerations
    3. Developing in-house training capabilities
    4. Instruction delivery methods
    5. Mandated health and safety programs
    6. Training program evaluation
    7. Training documentation
8. Problem-solving
    1. Realizing the problem exists
    2. Stating the problem
    3. Analyzing the problem
    4. Generating possible solutions
    5. Selecting the best solution
    6. Putting the solution to work
    7. Monitoring and adjusting
    8. Evaluating
    9. Managing change
9. Decision–making
    1. Decision tools
    2. Group-decision making
    3. Decision analysis
10. Technical issues and regulatory compliance
    1. Understanding facility design
        1. Water treatment facility design and management responsibilities
        2. Wastewater treatment facility design and management responsibilities
    2. Controlling the treatment processes
        1. Maintenance Planning
        2. Predictive maintenance
    3. Policies and standard operating procedures
    4. Technical skills (conducting a needs assessment)
11. Financial management
    1. The cost of services and revenue
    2. Measuring financial stability
    3. Budgeting
    4. Equipment-repair or replace
    5. Capital budgets
    6. Local government borrowing and debt
12. Monitoring the financial picture-monthly reports
    1. Computers in managing a utility
        1. Computerized maintenance management systems (CMMS)
        2. Geographical information system (GIS)
        3. Supervisory Controls Acquisition and Data Systems (SCADA)
    2. Instrumentation and control systems
    3. Programmable logic controllers
13. Emergency planning
    1. Vulnerability assessment
    2. Mandatory OSHA and EPA emergency response plans
        1. Health and safety programs

2. Key elements of an effective health and safety program
3. Successful implementation
4. Violence in the workplace
5. Utility security

14. Community relations
    1. Types of programs
    2. Importance of and need for public education
        1. Media relations
        2. Political relations
        3. Public speaking
        4. Handling customer inquiries
        5. Consumer confidence reports
        6. Plant tours
15. Personal and professional skills
    1. The manager's environment
    2. The manager's professional code of conduct

Methods of Instruction:

Methods of instruction may include, but are not limited to the following:

- **Method:** In-class Exercises
  Integration: Instructor-led or small group activities and discussion of the main elements of a utility manager's job. Organizational planning, strategic direction, and level of service objectives will be based on data evaluation and modeling.
- **Method:** Lecture
  Integration: Presentation and discussion with supporting visual materials (PowerPoints, overheads, or multimedia) of the water topics will be used as an instructional tool to introduce concepts and terminology relevant to water utility management principles throughout the course.
- **Method:** Discussion
  Integration: Integration: Small group discussion allows for students to discuss in detail, review, and application of content. This allows for students to put into practice/use terminology and concepts related to water utility management.
- **Method:** Film/video Viewing and Discussion
  Integration: Videos and/or slides will be used to provide a better understanding of water utility operations. Videos will include facility design and/or maintenance activities as well as budgeting techniques used to determine the financial viability of a large water agency.
- **Method:** Homework
  Integration: Various writing assignments will be given to summarize major concepts discussed relevant to water utility management.
- **Method:** Activity
  Integration: Supplemental material will include reviews of current news articles concerning water issues such as new technology, advances in facility design, regulations, and environmental advocacy.
- **Method:** Visiting Lecturers
  Integration: Guest lecturers will enhance students comprehension by exposing students to people who are up to date in water utility operations, regulations, and real world field experience.

Methods of Evaluation:

A student's grade shall be determined by the instructor using multiple measures of performance related to the course objectives. Methods of evaluation may include but are not limited to the following:

- **Method:** Class Work
  Integration: Students will be evaluated on a variety of written assignments demonstrating an understanding of the functions of a water utility manager as well as the management processes that ensure the sustainability of water and wastewater systems. The final written work product will be graded for accuracy, completeness, and

demonstrated mastery of the subject matter.

- **Method:** Exams/Tests
  Integration: Periodic testing at the midpoint and final week of the semester will be utilized to determine content understanding of terminology, knowledge of subject matter, and the ability to evaluate utility management processes. The final written work product will be graded for accuracy, completeness, and demonstrated mastery of the subject matter.
- **Method:** Homework
  Integration: Written out of the classroom assignments will be administered to determine the student's understanding of industry concepts and knowledge of the basic as well as emerging principles of the water and wastewater industry. The final written work product will be graded for accuracy, completeness, and demonstrated mastery of the subject matter.
- **Method:** Quizzes
  Integration: Periodic short objective tests of course-related concepts such as quality control, continuous improvement, environmental laws, strategic planning, and assessment of the financial strength of a water utility. The final written work product will be graded for accuracy, completeness, and demonstrated mastery of the subject matter.
- **Method:** Research Projects
  Integration: Students will conduct research related to concepts and skills developed throughout the course to include: adherence to federal, state, tribal, territorial, and local regulations plus the institution of practices that protect public health and the environment. The final written work product will be graded for completeness and demonstrated mastery of the subject matter.

Examples of Assignments:

Students will be expected to understand and critique college level texts or the equivalent. Reading and writing, as well as out of class assignments are required. These assignments may include but are not limited to the following:

1. Read the chapter in the textbook on "Planning and Organizing," and define the following terms:
    1. Authority
    2. Responsibility
    3. Delegation
    4. Accountability
    5. Unity of command
2. Write a five page term paper that details the physical components of the system investigated, the monetary value of these assets and the importance of managing these facilities in a fiscally responsible manner.
3. In order to develop an appreciation for the requirements of management, it often is necessary for managers to take a close look at their existing water or wastewater treatment system. Select a small water distribution, water treatment or sanitation system and conduct a facilities background check which classifies the water system by source, water usage or production per capita, and identify the major components of the system.
4. Construct an organizational chart of a typical water agency and identify the lines of authority and responsibility.

Textbooks:

- California State University, Office of Water Programs (2005). *Manage for Success: Effective Utility Leadership Practices* California State University, Office of Water Programs. ISBN: 978-1-59371-002-6
- Lauer, William C. (2001). *Excellence in Action: Water Utility Management in the 21st Century* American Water Works Association. ISBN: 978-1-58321-159-5
- California State University, Office of Water Programs (2004). *Utility Management* California State University. ISBN: 978-1-884701-49-8

Other Resources:

Minimum Qualification

- Environmental Technologies