

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO



Sault College

COURSE OUTLINE

COURSE TITLE: Wastewater Treatment

CODE NO. : WTR 226 **SEMESTER:** III

PROGRAM: Environmental-Water Engineering Technology

AUTHOR: *Subhash Verma; P.Eng.*

DATE: May, 2009 **PREVIOUS OUTLINE DATED:**

APPROVED:

	_____	_____
	Chair	DATE
TOTAL CREDITS:	5	
PREREQUISITE(S):	WTR 241	
Hours/Week	5	

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For additional information, please contact, Brian Punch, Chair
School of Natural Environment/Outdoor Studies & Technology Programs
(705) 759-2554, Ext. 2681

I. COURSE DESCRIPTION:

To present basic knowledge and practices, theories, and application relevant to wastewater flows and characteristics, treatment processes, and plant operations. Basic concepts in wastewater treatment as applied to municipal and compatible industrial environmental systems are discussed.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

Upon successful completion of this course, the student will demonstrate the ability to:

1. Assess and evaluate wastewater flows and characteristics.
 - List the physical and chemical characteristics of sewage water
 - Compare primary and secondary treatment
 - Calculate BOD and solids removals
 - Manually prepare a composite sample
2. Perform basic design calculations of primary treatment processes.
 - Name of the devices used in preliminary and primary treatment
 - Calculate hydraulic loading on a clarifier
 - Differentiate between the settling characteristics of primary and secondary clarification
 - Estimate the quantity of sludge produced
3. Operate and trouble shoot an activated sludge process
 - Name the components of a biological process
 - Understand the biology of activated sludge process
 - Calculate F/M ratio and SRT sludge age (SRT)
 - Perform process control tests including oxygen uptake and settleability tests
 - Calculate the oxygen transfer efficiency
4. Operation of stabilization ponds and fixed growth biological systems
 - Describe various types of stabilization ponds
 - Name the main components of a trickling filter system and a RBC system
 - Describe common operating problems
 - Calculate the loading, storage time available and expected removal efficiencies
 - Describe the working principle of household septic units

5. Diagnose the operating problems related to the operation and control of the activated sludge process.
 - Differentiate between cause and system
 - List steps for troubleshooting
 - Describe the various process control tests
 - Describe various situations causing a process upset

III. TOPICS:

1. Wastewater Flow and Characteristics
2. Preliminary and Primary Treatment
3. Activated Sludge Process (ASP)
4. Other Biological Systems
5. Operation of Treatment Plants

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

Water and Wastewater - Technology by Mark J. Hammer and Hammer Junior, Prentice Hall, 6th edition, 2008
Course Manual –by S. Verma, Environmental Training Services, April, 2008, PDF file, LMS

V. EVALUATION PROCESS/GRADING SYSTEM:

Final mark in the course will be based on:

Laboratory Work	25%
Home work/Quizzes	25%
Tests	50%

A passing grade will be based on a composite grading of 50%.

The following semester grades will be assigned to students in postsecondary courses:

<u>Grade</u>	<u>Definition</u>	<u>Grade Point Equivalent</u>
A+	90 - 100%	4.00
A	80 - 89%	4.00
B	70 - 79%	3.00
C	60 - 69%	2.00
D	50 - 59%	1.00
F (Fail)	< 50%	0.00

CR (Credit)	Credit for diploma requirements has been awarded.
X	A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.
NR	Grade not reported to Registrar's office.
W	Student has withdrawn from the course without academic penalty.

VI. SPECIAL NOTES:

Course Outline Amendments:

The professor reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources.

Retention of Course Outlines:

It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other postsecondary institutions.

Prior Learning Assessment:

Students who wish to apply for advance credit transfer (advanced standing) should obtain an Application for Advance Credit from the program coordinator (or the course coordinator regarding a general education transfer request) or academic assistant. Students will be required to provide an unofficial transcript and course outline related to the course in question. Please refer to the Student Academic Calendar of Events for the deadline date by which application must be made for advance standing. Credit for prior learning will also be given upon successful completion of a challenge exam or portfolio. Substitute course information is available in the Registrar's office.

Disability Services:

If you are a student with a disability (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your professor and/or the Disability Services office. Visit Room E1101 or call Extension 2703 so that support services can be arranged for you.

Communication:

The College considers **WebCT/LMS** as the primary channel of communication for each course. Regularly checking this software platform is critical as it will keep you directly connected with faculty and current course information. Success in this course may be directly related to your willingness to take advantage of the **Learning Management System** communication tool.

Plagiarism:

Students should refer to the definition of “academic dishonesty” in *Student Code of Conduct*. A professor/instructor may assign a sanction as defined below, or make recommendations to the Academic Chair for disposition of the matter. The professor/instructor may (i) issue a verbal reprimand, (ii) make an assignment of a lower grade with explanation, (iii) require additional academic assignments and issue a lower grade upon completion to the maximum grade “C”, (iv) make an automatic assignment of a failing grade, (v) recommend to the Chair dismissal from the course with the assignment of a failing grade. In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced, and to credit the author of the material, it is the policy of the department to employ a documentation format for referencing source material.

Student Portal:

The Sault College portal allows you to view all your student information in one place. **mysaultcollege** gives you personalized access to online resources seven days a week from your home or school computer. Single log-in access allows you to see your personal and financial information, timetable, grades, records of achievement, unofficial transcript, and outstanding obligations, in addition to announcements, news, academic calendar of events, class cancellations, your learning management system (LMS), and much more. Go to <https://my.saultcollege.ca>.

Electronic Devices in the Classroom:

Students who wish to use electronic devices in the classroom will seek permission of the faculty member before proceeding to record instruction. With the exception of issues related to accommodations of disability, the decision to approve or refuse the request is the responsibility of the faculty member. Recorded classroom instruction will be used only for personal use and will not be used for any other purpose. Recorded classroom instruction will be destroyed at the end of the course. To ensure this, the student is required to return all copies of recorded material to the faculty member by the last day of class in the semester. Where the use of an electronic device has been approved, the student agrees that materials recorded are for his/her use only, are not for distribution, and are the sole property of the College.

Attendance:

Sault College is committed to student success. There is a direct correlation between academic performance and class attendance; therefore, for the benefit of all its constituents, all students are encouraged to attend all of their scheduled learning and evaluation sessions. This implies arriving on time and remaining for the duration of the scheduled session. *It is the departmental policy that once the classroom door has enclosed, the learning process has begun. Late arrives will not be granted admission to the room*

Tuition Default:

Students who have defaulted on the payment of tuition (tuition has not been paid in full, payments were not deferred or payment plan not honoured) as of the first week of *November* will be removed from placement and clinical activities. This may result in loss of mandatory hours or incomplete course work. Sault College will not be responsible for incomplete hours or outcomes that are not achieved or any other academic requirement not met as of the result of tuition default. Students are encouraged to communicate with Financial Services with regard to the status of their tuition prior to this deadline to ensure that their financial status does not interfere with academic progress.