



A POLYTECHNIC INSTITUTION

School of Manufacturing, Electronics & Industrial Processes
Program: Part Time Studies
Option: Mechanical Systems

MSYS 2079
HVAC Load Analysis

Start Date:	September 12, 2006	End Date:	December 12, 2006
Total Hours:	42	Total Weeks:	14
Hours/Week:	3	Lecture:	3
		Lab:	
Prerequisites		MSYS 2079 is a Prerequisite for:	
Course No.	Course Name	Course No.	Course Name
		MSYS 4079	Air-conditioning systems

■ **Course Description**

Establishes analytical backgrounds for calculating heating, cooling and ventilation loads required in commercial, institutional and residential buildings. Topics include use of climatic data, comfort conditions, ASHRAE criteria standards, and methods of determining heat loss and heat gains. Computer-aided techniques will be demonstrated.

■ **Evaluation**

(Course marks weighting is subject to adjustment)

Assignment	15%	Comments: Change may be allowed to suit specific purposes. Notices will be given should any change occur.
Mid-term Exam	35%	
Final Exam	50%	
TOTAL	<u>100%</u>	

■ **Course Learning Outcomes/Competencies**

Upon successful completion, the student will be able to:

1. Calculate the heat transmission coefficients for any building construction types.
2. Demonstrate a working knowledge of the physiological principles governing comfort and health by applying the ASHRAE standards and guidelines to HVAC system design.
3. Establish both indoor and outdoor design conditions for any building in any climate.
4. Calculate sensible heat, latent heat, and sensible heat ratio and ratio line.
5. Conduct heating, cooling and ventilation load calculations both manually and computer aided.
6. Estimate HVAC loads for various types of buildings by using industry standard methods - ASHRAE.
7. Use psychrometric chart to quantify the physical & thermodynamic properties of the working fluids.

- 8. Analyze air-conditioning processes on the psychrometric chart.
- 9. Use computer software to conduct process analysis and refrigeration capacity.

■ Verification

I verify that the content of this course outline is current.

Authoring Instructor

Sept 11/2006

Date

I verify that this course outline has been reviewed.

Program Head/Chief Instructor

Sept 10/06

Date

I verify that this course outline complies with BCIT policy.

Dean/Associate Dean

2006/09/12

Date

Note: Should changes be required to the content of this course outline, students will be given reasonable notice.

■ Instructor(s)

Joseph Cheung Office Location: SW9 202 Office Phone: 604 451 6831
Office Hrs.: By Appointment E-mail Address: jcheung19@my.bcit.ca

■ Learning Resources

Required:

Lecture notes MSYS 3382 – HVAC Load Analysis

Recommended:

ASHRAE Handbooks - Fundamental

■ Information for Students

Note: Please refer to BCIT policy number 5002, Student Regulations Policy, for additional information. Policies are available at <http://www.bcit.ca/about/administration/policies.shtml>.

Ethics: BCIT assumes that all students attending the institute will follow a high standard of ethics. Incidents of cheating or plagiarism may, therefore, result in a grade of zero for the assignment, quiz, test, exam or project for all parties involved and/or expulsion from the course.

Assignments: Assignments, lab reports or projects must be done on an individual basis unless otherwise specified by the instructor. Late assignments, lab reports or projects will be devalued 20% per day late to a maximum of 3 days late.

Makeup Tests, Exams or Quizzes: There will be **no** makeup tests, exams or quizzes. If you miss a test, exam or quiz, you will receive zero marks. Exceptions may be made for **documented** medical reasons or extenuating circumstances. In such a case, it is the responsibility of the student to inform the instructor **immediately**.

Attendance: The attendance policy as outlined in BCIT Policy 5002 will be enforced. Attendance will be taken at the beginning of each session. Students not present at that time will be recorded as absent.

Illness: If you miss an evaluation such as an assignment, quiz, exam, or project, or you miss 3 or more consecutive days of class, you must provide the department with a BCIT Student Medical Certificate (available at <http://www.bcit.ca/admission/downloads.shtml>). You may be asked to complete the work that you missed or the course evaluation may be adjusted to reflect the missed component(s).

Attempts: Students must successfully complete a course within a maximum of three attempts. Students with two attempts in a single course must get written permission from the Associate Dean to attempt the course for the third time. Students who have not successfully completed a course within three attempts will not be eligible to graduate from the program.

Advancement: Students who fail three or more courses in a term cannot advance to the next term and may be asked to discontinue from the program.

Course Outline Changes: The material or schedule specified in this course outline may be changed by the instructor. If changes are required, they will be announced in class.

■ Assignment Details

Schedule

Week of/ Number	Outcome/Material Covered	Reference/ Reading	Assignment	Due Date
Week 1	Module 1 – Thermal comfort			
Lab 1	Thermal comfort		1	
Week 2	Module 2 – Indoor Air Quality			
Lab 2	Ventilation calculations		2	
Week 3	Shinerama – No Class			
Lab 3	Module 3 - Psychrometrics			
Week 4	Module 4 – Sensible & Latent Heat			
Lab 4	Psychrometrics		3	
Week 5	Module 5 - Basic Heat Transfer			
Lab 5	Sensible & latent heat		4	
Week 6	Module 6 – Heating Load			
Lab 6	Basic heat transfer		5	
Week 7	Module 7 cooling Load Calculations			
Lab 7	Mid-Term Exam # 1			
Week 8	Mid-term exam answer review			
Lab 8	Heating calculation using Excel spreadsheet		6	
Week 9	Module 9 – Psychrometrics II - Heating & Cooling Processes			
Lab 9	Cooling Load Calculations using Excel Spreadsheet		7	
Week 10	Lab - Psychrometric II calculations		8	
Lab 10	Module 8 Trace Computer calculations		9	

Week 11	Module 10 – Indoor Air Quality II			
Lab 11	Trace Load Calculations			Next lab Session
Week 12	Lab - Indoor air quality II			
Lab 12	Trace Load Calculations		10	Next lab Session
Week 13	Final exam review			
Lab 13	Trace Load Calculations			
Week 14	Final Examination			
Lab 14				