

Course Syllabus

Course Title: **Mechanical and Electrical Technology**
Course Number: **CM F142 TE1 CRN XXXXX**
Credits: 3 Credit Hours
Location: Community and Technical College, 604 Barnette St., Rm 311
Meeting Time: Monday 6:00 PM to 9:00 PM (Jan. 23 - May 01, 2017)

Instructor: Mark Frame, P.E.
Office hours by appointment only
Phone: XXX-XXXX
Email: mframe2@alaska.edu

Department Contact: Galen Johnson, Coordinator, Construction Management CTC
Rm 320 Phone: 455-2846 email: gjohns55@alaska.edu
Appointments available at: **gjohns55.youcanbook.me**
Martha Westphal, Admin. Assistant, 455-2886 mmwestphal@alaska.edu

Course Text: Mechanical and Electrical Systems in Buildings 5th edition ISBN 0-13-801562-7 Janis & Tao, Pearson Prentice Hall Publishers

Course Description: CM F142 introduces the basic mechanical and electrical systems required in all buildings for the safety, health, comfort, and convenience of the occupants. Emphasizes design criteria, code requirements and interpretation of construction drawings. (3+0)

Class sessions will consist of lectures, discussions, homework, projects and tests with emphasis on realistic assignments that will introduce students to building systems concepts, design parameters and terminology.

CM F142 topics include:

- Introduction to applicable codes & standards and construction specifications & drawings
- HVAC – Psychrometrics, Ventilation/Cooling Loads, Delivery Systems and equipment
- Plumbing equipment and systems
- Fire Protection equipment and systems
- Introduction to electricity
- Electrical Power equipment and systems
- Communications, Life Safety and Security
- Electrical Design and Wiring
- Lighting equipment and systems

Course Goals: This course will introduce a basic knowledge of building mechanical and electrical systems to entry-level construction managers.

Student Learning Outcomes: Upon successful completion of the course, the student will be able to -

- Locate appropriate discipline in design documents and Identify applicable code or standard.
- Summarize the effects of heat transfer, temperature and humidity, building solar design/orientation and fresh air ventilation on human comfort.
- Describe the effect that climate, construction assemblies and construction systems have on the building's insulating capability and heating fuel usage.
- Identify the components and equipment used in HVAC systems.
- Identify sources of potable water, explain the use of regulatory codes for system installations, differentiate between various piping materials and compute the size of piping depending on

- system demand and design.
- Identify the elements and the purpose of a separate drainage piping system within a building and define the purpose of venting to the atmosphere and fresh air ventilation on human comfort.
- Understand principles of Watts and Ohm's laws define the behavior of electrical circuits.
- Explain how electrical power is generated and conducted.
- Describe the different types of electrical services, compute building service loads, describe the use of electrical panels, disconnect switches and circuit breakers.
- Identify the requirements for low power systems such as building controls, communication, fire alarm and TV.
- Examine different types of branch circuitry for residential and commercial buildings, identify the materials and methods used, estimate branch circuit loads for lighting, appliances and motors.
- Define various types of interior lighting and lighting levels by activity within building spaces.

Outcome will be assessed by the following:

- Class Participation
- Projects
- Homework
- Exams

Instructional Methods: Class sessions will consist of lecture/discussions, homework and field trips, when possible.

Course Calendar: See Schedule of Topics attached.

Course Policies and Procedures:

University Policies - Please review all university policies as written in the current UAF catalog.

- Attendance - Students are required to attend regularly and participate actively. Students are responsible for class work even if there is a legitimate excuse for their absence. Team Projects and Lab activities during class will not be repeated for the benefit of absentees.
- Cheating - Any means by which a student uses unauthorized assistance to prepare materials submitted as their own. Cheating is grounds for dismissal from the university. This includes the unauthorized use or exchange of computer files.
- Smoking - No tobacco usage on campus.
- ID Cards - Students should carry their UAF Student ID cards with them whenever they are on campus.

Department Policies

- Emergency Exits – In case of emergency, exit the room into the main corridor. Exits may be reached by going either direction down the corridor. Fire alarm pull stations and fire extinguishers are located in the corridor.
- Food/Drink - Covered drinks are allowed, food is not.
- Grades - Final Grades will be posted to UAOnline.
- Name - Put your name on all papers/projects or you may not receive credit for it.
- Deadlines – Weekly assignments are due at the beginning of the designated following class period. Late work may not earn full credit.

Evaluation:

- Homework: Questions will be assigned from the text book and other sources which are used in presenting scheduled topics.
- Projects: There will be two small projects assigned during the semester based on major learning

fields. Students will be given two weeks to complete the projects.

- Exams: There will be three exams each worth 150 points. They will be “open book”. There will be true/false questions, multiple-choice questions and story problems. Questions will be derived from the assigned text reading, lectures, homework and quizzes.
- Makeup Tests: Make-up tests may be given upon approval by the instructor. The time for make-up tests will be arranged directly with the instructor.
- Participation: 10 points will be awarded for on-time attendance and participation in discussion in each class session. Pre-notification of unavoidable absences will garner partial credit versus “no-shows”.

Grading Policy: All grades are determined by competency-based criteria evaluation. Students are evaluated on individual performances and are not graded in comparison with other students or normal curve distribution. Letter grades for the course will reflect the *Grading System and Grade Point Average Computation* policy stated in the current UAF catalog. Faculty initiated withdrawals for non-attendance, plagiarism, and disruptive behavior is per current UAF Catalog guidelines.

Grade Tabulation

Homework	200 pts
Projects	200 pts
Exam 1	150 pts
Exam 2	150 pts
Exam 3	150 pts
Participation	150 pts
Total Points	1,000 pts

Grading Scale: (note: no +/- grades)

A	90%
B	80%
C	70%
D	60%

Support Services:

The CTC Student Assistance/Advising Center provides services that contribute to a successful learning experience and transition to a career. Services are available by appointment and on a walk- in basis. Staff at the center recognizes the unique concerns of adult and returning students. Services include preadmission advising, academic assessment and placement advising, financial aid information and application, and assistance with choosing a major. Ongoing academic advising, degree planning and course selection are available. For more information, contact Student Assistance, UAF Community and Technical College, 604 Barnette Street, Fairbanks, Alaska 99701, telephone (907) 455-2800, or visit online at <http://www.ctc.uaf.edu/student/index.html>.

Disability Services:

Disability Services provide a variety of services to assure equal access for all students. Interpreting services, educational assistants, note taking, and exam accommodations for students are the most frequently provided accommodations. The staff of Disability Services works with faculty in arranging appropriate services in the classroom. Questions should be directed to the Director of Disability Services at (907)-474-5655. Visit their website at: <http://www.uaf.edu/disability/index.html>

Title IX:

University of Alaska Board of Regents have clearly stated in BOR Policy that discrimination, harassment and violence will not be tolerated on any campus of the University of Alaska. If you believe you are experiencing discrimination or any form of harassment including sexual harassment, misconduct or assault, you are encouraged to report that behavior. If you disclose sexual harassment or sexual violence to a faculty member or any university employee, they must notify the UAF Title IX Coordinator about the basic facts of the incident. Your choices for disclosure include:

- 1) You may confidentially disclose and access confidential counseling by contacting the UAF Health & Counseling Center at 474-7043;
- 2) You may access support and file a Title IX report by contacting the UAF Title IX Coordinator at 474-6600;
- 3) You may file a criminal complaint by contacting the University Police Department at 474-7721.

SCHEDULE OF TOPICS

CM F142 Mechanical & Electrical Technology

Instructor: Mark Frame, P.E.

Jan 23 – May 01, 2017
Mondays 6:00pm – 9:00pm

Class 01 Jan 23

Introduction: Class Schedule & Syllabus
Browse text: Mechanical and Electrical Systems in Buildings (5th edition) by Janis & Tao

Class 02 Jan30

Topic: Intro to Mech & Elec Systems and HVAC Fundamentals
Reading: Chapters 1 & 2

Class 03 Feb 06

Topic: HVAC Delivery and Cooling Systems
Reading: Chapter 3 & 4

Class 04 Feb 13

Topic: Heating and Air Handling Systems
Reading: Chapters 5 & 6

Class 05 Feb 20

Topic: Piping & Plumbing Eq. & Systems
Reading: Chapters 7 & 8
Exam #1 Study Review

Class 06 Feb 27

Exam #1

Class 07 Mar 06

Topic: Fire Protection
Reading: Chapter 9

Mar 13 Spring Break, no class

Class 08 Mar 20

Topic: Intro to Electricity
Reading: Chapter 10

Class 09 Mar 27

Topic: Power Equipment & Systems
Reading: Chapter 11
Project 1 due

Class 10 Apr 03

Topic: Communication, Safety, Security Systems and Electrical Design
Reading: Chapters 12 & 13
Exam #2 Study Review

Class 11 Apr 10

Exam #2

Class 12 Apr 17

Topic: Light, Lighting Equip & Systems, Illumination Calcs and Lighting Design
Reading: Chapters 14 - 17

Class 13 Apr 24

Topics: Noise & Vibration and Systems Coordination
Reading: Chapter 18 & 19
Project 2 due
Exam #3 Study Review

Class 14 May 01

Exam #3

NOTE: Schedule subject to change by Instructor upon prior notice.

