



## COURSE OUTLINE: CJS428 - INTRO TO FIRE SCIEN

Prepared: sbolduc

Approved: Karen Hudson - Dean

<b>Course Code: Title</b>	CJS428: INTRODUCTION TO FIRE SCIENCE
<b>Program Number: Name</b>	1225: PROTECTION SECURITY
<b>Department:</b>	CRIMINAL JUSTICE
<b>Academic Year:</b>	2025-2026
<b>Course Description:</b>	<p>This course will cover material from a scientific perspective. Elements of Chemistry, Physics and Math, discussed to develop an understanding of the chemistry of fires and the operation of firefighting equipment. Characteristics of matter exposed to heat will be introduced to study the reaction that heat has on all forms of matter during firefighting operations. Included in this course are the principles of hydraulics and formulas related to pump operation and water flow. This course will also introduce the student to the realities of dealing with hazardous materials. The fundamentals NFPA training and the recognition, control and evaluation of hazards are examined. Students will develop skills to interpret safety data sheets and to determine the appropriate course of action to take for the hazard present.</p>
<b>Total Credits:</b>	3
<b>Hours/Week:</b>	3
<b>Total Hours:</b>	42
<b>Prerequisites:</b>	There are no pre-requisites for this course.
<b>Corequisites:</b>	There are no co-requisites for this course.
<b>Substitutes:</b>	OEL595
<b>Vocational Learning Outcomes (VLO's) addressed in this course:</b>	<b>1225 - PROTECTION SECURITY</b>
<b>Please refer to program web page for a complete listing of program outcomes where applicable.</b>	VLO 1 Work in compliance with established standards and relevant legislation in the protection, security and investigation fields.
	VLO 2 Make decisions in a timely, effective and legally defensible manner to uphold protection and security.
	VLO 3 Carry out delegated duties and responsibilities in compliance with organizational policies and procedures.
	VLO 4 Act equitably and justly with diverse populations.
	VLO 5 Work effectively as a member of a protection and security team.
	VLO 6 Prevent and resolve crisis, conflict and emergency situations by applying effective techniques.
	VLO 7 Conduct and/or contribute to investigations by collecting, preserving and presenting admissible evidence.
	VLO 8 Monitor, evaluate and accurately document behaviours, situations and events.
	VLO 9 Develop and implement ongoing effective strategies for personal and professional development.



**Essential Employability Skills (EES) addressed in this course:**

- EES 1 Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience.
- EES 2 Respond to written, spoken, or visual messages in a manner that ensures effective communication.
- EES 3 Execute mathematical operations accurately.
- EES 4 Apply a systematic approach to solve problems.
- EES 5 Use a variety of thinking skills to anticipate and solve problems.
- EES 6 Locate, select, organize, and document information using appropriate technology and information systems.
- EES 7 Analyze, evaluate, and apply relevant information from a variety of sources.
- EES 8 Show respect for the diverse opinions, values, belief systems, and contributions of others.
- EES 9 Interact with others in groups or teams that contribute to effective working relationships and the achievement of goals.
- EES 10 Manage the use of time and other resources to complete projects.
- EES 11 Take responsibility for ones own actions, decisions, and consequences.

**Course Evaluation:**

Passing Grade: 60%, C

A minimum program GPA of 2.0 or higher where program specific standards exist is required for graduation.

**Course Outcomes and Learning Objectives:**

<b>Course Outcome 1</b>	<b>Learning Objectives for Course Outcome 1</b>
1. Public Fire Protection	1.1 Identify the origins of modern fire protection 1.2 Describe the evolution of fire protection 1.3 List the cause for the change from volunteer to public fire departments 1.4 List and describe the responsibilities of a public fire department 1.5 Describe the evolution of equipment and protective clothing 1.6 Discuss the current fire problems in existence 1.7 Describe the different ranks and responsibilities and organization of the fire department in Sault Ste. Marie 1.8 Describe the process and requirements of becoming a firefighter in Ontario 1.9 List and discuss the principles of life safety 1.10 Describe the code of ethics and firefighter's creed 1.11 List and describe the myths about fire
<b>Course Outcome 2</b>	<b>Learning Objectives for Course Outcome 2</b>
2. Fire Safety Legislation in Ontario ( <a href="http://www.gov.on.ca/OFM/">www.gov.on.ca/OFM/</a> )	2.1 List and describe pertinent building code sections for fire 2.2 List and describe pertinent Occupation Health and Safety Act sections for fire 2.3 List and describe Ontario Fire Code sections 2.4 List and describe Fire Protection and Prevention Act sections
<b>Course Outcome 3</b>	<b>Learning Objectives for Course Outcome 3</b>



	3. Chemistry and Physics of Fire	3.1 Define and describe the fire triangle and fire tetrahedron 3.2 Describe what constitutes an oxidizer 3.3 Describe what constitutes a fuel 3.4 Describe the three states of matter 3.5 Describe the properties or characteristics that affect solids, liquids and gas 3.6 Describe the differences between heat and temperature 3.7 Describe the four methods of heat transfer 3.8 Describe the four classifications of fire 3.9 Describe the three phases of fire 3.10 Describe the fire extinguishment theory as it applies to each class of fire 3.11 Define and explain fire terminology
	<b>Course Outcome 4</b>	<b>Learning Objectives for Course Outcome 4</b>
	4. Fire Protection Systems and Equipment	4.1 Describe the components of a water supply system 4.2 Describe fire detection equipment and their use 4.3 Describe various types of fire extinguishments systems and components 4.4 Describe the types of extinguishments agents and their uses 4.5 Explain how various types of extinguishment agents work to extinguish fire 4.6 List and describe fire protection equipment used for personal protection of a firefighter 4.7 List and describe the comprehensive fire safety effectiveness model and its sub-components 4.8 List and discuss the 10 rules of engagement for structural fires 4.9 Define and describe types of fire apparatus and equipment
	<b>Course Outcome 5</b>	<b>Learning Objectives for Course Outcome 5</b>
	5. Fire Prevention	5.1 Describe the importance of prevention 5.2 Describe typical fire prevention activities 5.3 List and describe methods of public education as they relate to prevention 5.4 List and describe the uses of fire-related statistics 5.5 Describe leading causes of fire in industrial and domicile locations 5.6 List and describe arson characteristics to determine fire cause
	<b>Course Outcome 6</b>	<b>Learning Objectives for Course Outcome 6</b>
	6. Fire Prevention Surveys	6.1 Define the term fire risk analysis 6.2 List and describe the components of a fire prevention/inspection survey 6.3 Complete a fire prevention survey

**Evaluation Process and Grading System:**

Evaluation Type	Evaluation Weight
Final Examination	40%
Mid Term Examination	30%

	Quizzes	30%
<b>Date:</b>	June 17, 2025	
<b>Addendum:</b>	Please refer to the course outline addendum on the Learning Management System for further information.	