



8838

ADVANCED CONSTRUCTION
AND SOLDERING (12B)

40S/40E/40M

A Jewellery/Metalsmithing Course

8838: ADVANCED CONSTRUCTION AND SOLDERING (12B) 40S/40E/40M

Course Description

This course is intended for students entering the transition phase of the jewellery and metalsmithing program. The curriculum content focuses on an extension of the knowledge and skills learned in 8814 (Basic Construction and Soldering), including hinges, tubing, and box clasps. Students use these materials and processes to create jewellery.

Goal 1: Describe and apply appropriate **safety and health** practices as they apply to the jewellery/metalsmithing trade.

GLO 1.1: Create and maintain a **safe workplace**.

- SLO 12B.1.1.1: Follow safe practices and procedures related to facilities, processes, materials, tools, and equipment used in the jewellery studio.
 - SLO 12B.1.1.2: Apply the principles of Workplace Hazardous Materials Information Systems (WHMIS) as they apply to the jewellery studio.
 - SLO 12B.1.1.3: Describe hazards related to processes, materials, tools, and equipment used in the jewellery studio.
 - SLO 12B.1.1.4: Follow the directions of the teacher/supervisor/employer in regard to safe work procedures.
 - SLO 12B.1.1.5: Comply with the laws, regulations, and standards of regulatory agencies and industry associations regarding safety.
 - SLO 12B.1.1.6: Locate first aid kit, eyewash station, fire extinguisher, fire blanket, and emergency power shut off switch.
 - SLO 12B.1.1.7: Demonstrate ventilation procedures, and dust and smoke reduction procedures.
 - SLO 12B.1.1.8: Demonstrate fire prevention and control strategies.
 - SLO 12B.1.1.9: Describe emergency evacuation and response procedures.
 - SLO 12B.1.1.10: Demonstrate safety zone markings and procedures.
 - SLO 12B.1.1.11: Discuss hazards related to compressed gas.
 - SLO 12B.1.1.12: Identify and report hazards (e.g., handling, chemicals, electrical, ergonomics, material handling, spills, and equipment damage) related to tools, equipment, processes, and materials in studio.
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GLO 1.2: Create and maintain **safe and healthy workplace practices.**

- SLO 12B.1.2.1: Explain the chemical points of entry into the body.
- SLO 12B.1.2.2: Describe and demonstrate appropriate personal protection (e.g., safety goggles/facemask, gloves, respirator mask, hair ties, apron, hearing protection).
- SLO 12B.1.2.3: Describe the injury reporting process.
- SLO 12B.1.2.4: Describe the use of fire blankets and fire extinguishers.
- SLO 12B.1.2.5: Describe the use of an eyewash station.
- SLO 12B.1.2.6: Demonstrate the ergonomic use of equipment and tools as it relates to bench tools and equipment operation.

Goal 2: Demonstrate knowledge of the identification, and the safe and appropriate **operation, cleaning, maintenance, and management of equipment, tools, and materials.**

GLO 2.1: Demonstrate the **identification**, and the safe and appropriate **operation of equipment and tools.**

- SLO 12B.2.1.1: Describe hand tools, power tools, equipment, and materials as they pertain to advanced construction and soldering.
- SLO 12B.2.1.2: Demonstrate the safe and appropriate operation of hand tools as it pertains to advanced construction and soldering.
- SLO 12B.2.1.3: Demonstrate the safe and appropriate operation of torch as it pertains to advanced construction and soldering.
- SLO 12B.2.1.4: Demonstrate the safe and appropriate use of the polishing/buffing machines as it pertains to advanced construction and soldering.
- SLO 12B.2.1.5: Demonstrate the safe and appropriate use of the flex-shaft.

GLO 2.2: Demonstrate the appropriate cleaning, maintenance, and management of equipment and tools.

- SLO 12B.2.2.1: Demonstrate the daily cleaning, maintenance, and management of equipment and tools as they pertain to advanced construction and soldering.
 - SLOS 12B.2.2.2: Discuss the scheduled cleaning, maintenance, and management of equipment and tools as they pertain to advanced construction and soldering.
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GLO 2.3: Demonstrate the appropriate **handling, storage, and management of materials.**

SLO 12B.2.3.1: Demonstrate the appropriate handling, storage, and management of materials and supplies as they pertain to advanced construction and soldering.

Goal 3: Demonstrate an understanding of **metallurgy, gemmology, and the characteristics of jewellery materials.**

GLO 3.1: Demonstrate an understanding of **metallurgy.**

SLO 12B.3.1.1: Demonstrate an understanding of the characteristics of metals as they pertain to advanced construction and soldering.

GLO 3.2: Demonstrate an understanding of **gemmology.**

SLO 12B.3.2.1: Demonstrate precautions and appropriate care of gem materials as they pertain to advanced construction and soldering.

GLO 3.3: Demonstrate an understanding of the **characteristics of jewellery materials.**

SLO 12B.3.3.1: Apply the principles of material characteristics to advanced construction and soldering.

Goal 4: Demonstrate knowledge of the creative **design** of jewellery.

GLO 4.1: Demonstrate knowledge of the creative **design** of jewellery.

SLO 12B.4.1.1: Identify the design problem as it pertains to advanced construction and soldering.

SLO 12B.4.1.2: Research the factors that influence design as they pertain to advanced construction and soldering.

SLO 12B.4.1.3: Recognize and apply the elements of design as they pertain to advanced construction and soldering.

SLO 12B.4.1.4: Identify the function of the design as it pertains to advanced construction and soldering.

SLO 12B.4.1.5: Identify the limitations of the materials as they pertain to advanced construction and soldering.

SLO 12B.4.1.6: Develop concept drawings for construction based on design criteria as they pertain to advanced construction and soldering.

Goal 5: Demonstrate an understanding of the **construction, casting, incorporation of components and gemstones, and production techniques** of jewellery creations.

GLO 5.1: Demonstrate the **construction techniques** used in creating jewellery from **sheet and wire**.

- SLO 12B.5.1.1: Demonstrate the basic operation of tools and equipment used in jewellery construction using sheet and wire as it pertains to advanced construction and soldering.
 - SLO 12B.5.1.2: Demonstrate the production of sheet from ingots using a rolling mill.
 - SLO 12B.5.1.3: Demonstrate the safe and appropriate use of the pickle pot.
 - SLO 12B.5.1.4: Demonstrate an understanding of soldering techniques as they pertain to advanced construction and soldering.
 - SLO 12B.5.1.5: Demonstrate the production of wire from ingots using a rolling mill and drawplates.
 - SLO 12B.5.1.6: Demonstrate the safe and appropriate use of a torch for annealing and soldering.
 - SLO 12B.5.1.7: Demonstrate the safe and appropriate use of burs for stone setting.
 - SLO 12B.5.1.8: Demonstrate the safe and appropriate use of the bending brake.
 - SLO 12B.5.1.9: Demonstrate the safe and appropriate use of forming equipment (e.g., mandrels, anvils, metal blocks) as it pertains to advanced construction and soldering.
 - SLO 12B.5.1.10: Demonstrate the production of tubing from sheet.
 - SLO 12B.5.1.11: Demonstrate the construction of a box clasp from sheet.
 - SLO 12B.5.1.12: Demonstrate the construction of a hinged bracelet.
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GLO 5.2: Demonstrate the **lost wax casting techniques** used in creating jewellery.

No applicable SLOs.

GLO 5.3: Demonstrate the **construction** of jewellery incorporating components such as **handmade and commercial findings**.

SLO 12B.5.3.1: Define terminology for findings and jewellery items as it relates to advanced construction and soldering.

SLO 12B.5.3.2: Incorporate findings into construction as they pertain to advanced construction and soldering.

SLO 12B.5.3.3: Demonstrate the construction of a box clasp from sheet.

SLO 12B.5.3.4: Demonstrate the construction of a hinged bracelet clasp.

GLO 5.4: Demonstrate **stone-setting techniques**.

SLO 12B.5.4.1: Demonstrate tube-setting stones.

GLO 5.5: Demonstrate **production techniques** in the construction of jewellery.

SLO 12B.5.5.1: Demonstrate the organization of work for the finishing process.

SLO 12B.5.5.2: Define the production and benefits to the jewellery trade.

SLO 12B.5.5.3: Demonstrate the grouping of chain links for soldering.

Goal 6: Demonstrate an understanding of the **finishing, polishing, and textural techniques** of jewellery creation.

GLO 6.1: Demonstrate the **finishing techniques** of jewellery creation.

SLO 12B.6.1.1: Identify the sequence of the finishing steps leading up to polishing as it pertains to advanced construction and soldering.

SLO 12B.6.1.2: Identify the tools and equipment used in finishing jewellery as they pertain to advanced construction and soldering.

SLO 12B.6.1.3: Demonstrate the sequence of finishing steps as they pertain to metal type, technique, and jewellery design as it relates to advanced construction and soldering.

GLO 6.2: Demonstrate the **polishing techniques** of jewellery creation.

SLO 12B.6.2.1: Identify the sequence of polishing techniques as it pertains to advanced construction and soldering.

SLO 12B.6.2.2: Select the sequence of polishing techniques during jewellery construction based on metal type, technique, and jewellery design as it relates to advanced construction and soldering.

GLO 6.3: Demonstrate the **textural finishing techniques** of jewellery creation.

SLO 12B.6.3.1: Demonstrate techniques for texturing as they relate to advanced construction and soldering.

Goal 7: Demonstrate knowledge of the **adjustment, modification, and repair** of jewellery.

GLO 7.1: Demonstrate an awareness of situations which require jewellery to be **adjusted, modified, or repaired**.

SLO 12B.7.1.1: Identify situations in which jewellery would require adjustments, modifications, or repairs using advanced construction and soldering.

GLO 7.2: Adjust jewellery.

SLO 12B.7.2.1: Adjust jewellery using advanced construction and soldering.

GLO 7.3: Modify jewellery.

SLO 12B.7.3.1: Modify jewellery using advanced construction and soldering.

GLO 7.4: Repair jewellery.

SLO 12B.7.4.1: Repair jewellery using advanced construction and soldering methods.

Goal 8: Demonstrate an understanding of the transferable, **cross-curricular** knowledge and skills as they pertain to the jewellery trade.

GLO 8.1: Read, interpret, and communicate.

SLO 12B.8.1.1: Read and identify project specifications as they pertain to advanced construction and soldering.

SLO 12B.8.1.2: Read and identify technical information as it pertains to advanced construction and soldering.

GLO 8.2: Apply mathematics knowledge and skills relevant to jewellery/metalsmithing.

SLO 12B.8.2.1: Define units of measurement and tools relating to the jewellery trade (e.g., metric and imperial measurements, weights and volumes, gauges) as they pertain to advanced construction and soldering.

SLO 12B.8.2.2: Demonstrate the use of basic geometry as it pertains to advanced construction and soldering.

GLO 8.3: Apply science knowledge and skills relevant to jewellery/metalsmithing.

No applicable SLOs.

GLO 8.4: Apply art knowledge and skills relevant to jewellery/metalsmithing.

SLO 12B.8.4.1: Demonstrate the creation of a design for project use related to advanced construction and soldering.

SLO 12B.8.4.2: Discuss and apply design elements as related to advanced construction and soldering.

GLO 8.5: Apply other subject areas knowledge and skills relevant to jewellery/metalsmithing (art, physical education/health education, information communication and technology, social studies).

SLO 12B.8.5.1: Demonstrate the use of Internet for design development and technical information as it pertains to advanced construction and soldering.

Goal 9: Demonstrate an understanding of **career opportunities** in the jewellery trade and associated professions.

GLO 9.1: Describe education and **career opportunities, and professional organizations** in the jewellery trade and associated professions.

SLO 12B.9.1.1: Discuss education and career opportunities in advanced construction and soldering.

Goal 10: Demonstrate awareness of **sustainability** as it pertains to the jewellery trade.

GLO 10.1: Describe the impact of **sustainability** on the health and well-being of metalsmiths and their clients.

SLO 12B.10.1.1: Identify ergonomics and repetitive movement strains as they pertain to advanced construction and soldering.

SLO 12B.10.1.2: Discuss sustainability as it relates to the human health and well-being of jewellers/metalsmiths and their clients as it pertains to advanced construction and soldering.

SLO 12B.10.1.3: Discuss the impact on health of metal and material allergies, dust, and toxicities as it pertains to advanced construction and soldering.

SLO 12B.10.1.4: Demonstrate proper use of equipment and tools to prevent repetitive strain injuries—ergonomics as it pertains to advanced construction and soldering.

GLO 10.2: Describe the trade's **sustainability practices** and impact on the environment.

SLO 12B.10.2.1: Demonstrate the appropriate disposal and/or recycling of materials and supplies as it pertains to advanced construction and soldering.

SLO 12B.10.2.2: Describe and apply the efficient use and disposal of materials as it pertains to advanced construction and soldering.

SLO 12B.10.2.3: Discuss chemical hazards on the environment as introduced as they pertain to advanced construction and soldering.

SLO 12B.10.2.4: Demonstrate a basic knowledge of efficient material usage to reduce waste and its impact on the environment.

GLO 10.3: Describe **sustainable business practices** within the jewellery trade.

No applicable SLOs.

Goal 11: Demonstrate **awareness of the ethical and legal standards** as they pertain to the jewellery trade.

GLO 11.1: Practise the **ethical and legal standards** as they pertain to the jewellery trade.

No applicable SLOs.

Goal 12: Demonstrate knowledge of the **employability skills** related to the jewellery trade.

GLO 12.1: Demonstrate the **fundamental employability skills**.

SLO 12B.12.1.1: Demonstrate problem-solving skills.

SLO 12B.12.1.2: Demonstrate critical-thinking skills.

SLO 12B.12.1.3: Demonstrate regular attendance and punctuality.

SLO 12B.12.1.4: Demonstrate accountability by taking responsibility for one's actions.

SLO 12B.12.1.5: Demonstrate adaptability, initiative, and effort.

SLO 12B.12.1.6: Demonstrate the ability to accept and follow direction and feedback.

SLO 12B.12.1.7: Demonstrate teamwork skills.

SLO 12B.12.1.8: Demonstrate the ability to stay on task and use class and studio time effectively.

SLO 12B.12.1.9: Demonstrate the ability to communicate respectfully and effectively with co-workers and customers.

SLO 12B.12.1.10: Demonstrate the ability to maintain an organized work area and use equipment, tools, and materials respectfully.

SLO 12B.12.1.11: Demonstrate appropriate dress for safe work with equipment and tools.

GLO 12.2: Demonstrate an understanding of the **business operation** of a jewellery/metalsmithing trade.

SLO 12B.12.2.1: Demonstrate the calculations of metal costs for projects.

Goal 13: Understand the **evolution and technological progression of, and the emerging trends in** the jewellery/metalsmithing trade.

GLO 13.1: Describe the **evolution and technological progression of, and the emerging trends in** the jewellery trade.

SLO 12B.13.1.1: Discuss the evolution and technological progression of, and the emerging trends in the jewellery trade as they pertain to advanced construction and soldering.

SLO 12B.13.1.2: Demonstrate the use of new technology as it pertains to advanced construction and soldering.
