



8814

BASIC CONSTRUCTION AND
SOLDERING (11B)

30S/30E/30M

A Jewellery/Metalsmithing Course

8814: BASIC CONSTRUCTION AND SOLDERING (11B) 30S/30E/30M

Course Description

This course is intended for students continuing in the specialization phase of the jewellery and metalsmithing program. The curriculum content focuses on an understanding of cold connections such as rivets, tabs, and links, as well as basic hard soldering. 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 11B.1.1.1: Follow safe practices and procedures related to facilities, processes, materials, tools, and equipment used in the jewellery studio.
 - SLO 11B.1.1.2: Apply the principles of Workplace Hazardous Materials Information Systems (WHMIS) as they apply to the jewellery studio.
 - SLO 11B.1.1.3: Describe hazards related to processes, materials, tools, and equipment used in the jewellery studio.
 - SLO 11B.1.1.4: Follow the directions of the teacher/supervisor/employer in regard to safe work procedures.
 - SLO 11B.1.1.5: Comply with the laws, regulations, and standards of regulatory agencies and industry associations regarding safety.
 - SLO 11B.1.1.6: Locate first aid kit, eyewash station, fire extinguisher, fire blanket, and emergency power shut off switch.
 - SLO 11B.1.1.7: Demonstrate ventilation procedures, and dust and smoke reduction procedures.
 - SLO 11B.1.1.8: Demonstrate fire prevention and control strategies.
 - SLO 11B.1.1.9: Describe emergency evacuation and response procedures.
 - SLO 11B.1.1.10: Demonstrate safety zone markings and procedures.
 - SLO 11B.1.1.11: Discuss hazards related to compressed gas.
 - SLO 11B.1.1.12: Identify and report hazards (e.g., 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 11B.1.2.1: Explain chemical points of entry into body.
 - SLO 11B.1.2.2: Describe and demonstrate appropriate personal protection (e.g., safety goggles/facemask, gloves, respirator mask, hair ties, apron, hearing protection).
 - SLO 11B.1.2.3: Describe the injury reporting process.
 - SLO 11B.1.2.4: Describe the use of fire blankets and fire extinguishers.
 - SLO 11B.1.2.5: Describe the use of an eyewash station.
 - SLO 11B.1.2.6: Demonstrate the ergonomic use of equipment and tools as it relates to bench tools and equipment operation.
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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 11B.2.1.1: Describe hand tools, power tools, equipment, and materials used in basic construction and soldering.
 - SLO 11B.2.1.2: Demonstrate the safe and appropriate operation of hand tools and equipment used in the basic construction and soldering of jewellery.
 - SLO 11B.2.1.3: Demonstrate the safe and appropriate use of the polishing/buffing machines as it pertains to basic construction and soldering.
 - SLO 11B.2.1.4: Demonstrate the safe and appropriate use of the flex-shaft.
 - SLO 11B.2.1.5: Demonstrate the safe and appropriate operation of torch as it pertains to basic construction and soldering of jewellery.
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GLO 2.2: Demonstrate the appropriate cleaning, maintenance, and management of equipment and tools.

- SLO 11B.2.2.1: Demonstrate the daily cleaning, maintenance, and management of equipment and tools used in basic construction and soldering.
 - SLO 11B.2.2.2: Discuss the scheduled cleaning, maintenance, and management of equipment and tools as they pertain to basic construction and soldering.
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GLO 2.3: Demonstrate the appropriate **handling, storage, and management of materials.**

SLO 11B.2.3.1: Demonstrate the appropriate disposal and/or recycling of materials and supplies as it pertains to basic construction and soldering.

SLO 11B.2.3.2: Demonstrate the appropriate storage of materials and supplies as it pertains to basic 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 11B.3.1.1: Define the ferrous and non-ferrous metals and their subgroups used in jewellery/metalsmithing.

SLO 11B.3.1.2: Define the terminology for descriptive characteristics and properties of metals as it pertains to basic construction and soldering.

SLO 11B.3.1.3: Define the characteristics of metals as they pertain to basic construction and soldering.

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

No applicable SLOs.

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

SLO 11B.3.3.1: Demonstrate the principles of material characteristics in construction processes as they pertain to basic 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 11B.4.1.1: Identify the design problems related to basic construction and soldering.
- SLO 11B.4.1.2: Research the factors that influence design as they pertain to basic construction and soldering.
- SLO 11B.4.1.3: Recognize and apply the elements of design as they pertain to basic construction and soldering.
- SLO 11B.4.1.4: Identify the function of the design as it pertains to basic construction and soldering.
- SLO 11B.4.1.5: Identify the limitations of the materials used in basic construction and soldering.
- SLO 11B.4.1.6: Develop concept drawings for construction based on design criteria related to basic 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 11B.5.1.1: Demonstrate the basic operation of tools and equipment used in jewellery construction using sheet and wire as it pertains to basic construction and soldering.
- SLO 11B.5.1.2: Demonstrate the application of standard, nail head, and flush rivets.
- SLO 11B.5.1.3: Demonstrate tab and slot construction.
- SLO 11B.5.1.4: Demonstrate the ability to pour sterling silver ingots.
- SLO 11B.5.1.5: Demonstrate the production of sheet from ingots using a rolling mill.
- SLO 11B.5.1.6: Demonstrate the production of wire from ingots using a rolling mill and drawplates.
- SLO 11B.5.1.7: Demonstrate the safe and appropriate use of the pickle pot.
- SLO 11B.5.1.8: Demonstrate the forming of cuff bracelets on a bracelet mandrel and anvil.
- SLO 11B.5.1.9: Demonstrate a variety of hard soldered joints using a variety of solders with sheet and wire.
- SLO 11B.5.1.10: Demonstrate the forming and production of jump-rings into complex soldered chains.
- SLO 11B.5.1.11: Demonstrate wire work forming with pliers as it pertains to basic construction and soldering.

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 11B.5.3.1: Define terminology for findings and jewellery items as it relates to basic construction and soldering.

SLO 11B.5.3.2: Incorporate findings into construction as they pertain to basic construction and soldering.

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

No applicable SLOs.

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

SLO 11B.5.5.1: Define production and benefits to trade as they pertain to basic construction and soldering.

SLO 11B.5.5.2: Demonstrate the production process when cutting multiples of pattern pieces as it pertains to basic construction and soldering.

SLO 11B.5.5.3: Demonstrate the organization of work for the finishing process as it pertains to construction and basic soldering.

SLO 11B.5.5.4: Demonstrate the grouping of chain links or other components 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 11B.6.1.1: Identify the sequence of the finishing steps leading up to polishing as they pertain to basic construction and soldering.

SLO 11B.6.1.2: Identify the tools and equipment used in finishing jewellery as they pertain to basic construction and soldering.

SLO 11B.6.1.3: Demonstrate the sequence of finishing steps as they pertain to metal type, technique, and jewellery design as it relates to basic construction and soldering.

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

SLO 11B.6.2.1: Identify the sequence of polishing techniques as it pertains to basic construction and soldering.

SLO 11B.6.2.2: Select the sequence of polishing techniques as they pertain to metal type, technique, and jewellery design as it relates to basic construction and soldering.

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

SLO 11B.6.3.1: Identify hand tools and techniques for texturing used in basic construction and soldering.

SLO 11B.6.3.2: Demonstrate textural finishing techniques with hammers and chasing tools as they pertain to basic construction and soldering.

SLO 11B.6.3.3: Demonstrate the use of a rolling mill for roller printing.

SLO 11B.6.3.4: Demonstrate the use of burs/flex-shafts to engrave and texture metal as it pertains to basic 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 11B.7.1.1: Identify situations in which jewellery would require adjustments, modifications, or repairs as they pertain to basic construction and soldering.

GLO 7.2: Adjust jewellery.

SLO 11B.7.2.1: Recognize and apply simple adjustments to the design and function of jewellery creations as they pertain to basic construction and soldering.

GLO 7.3: Modify jewellery.

SLO 11B.7.3.1: Demonstrate an understanding of basic construction and soldering when performing modifications to jewellery creations.

GLO 7.4: Repair jewellery.

SLO 11B.7.4.1: Demonstrate an understanding of basic construction and soldering when performing repair techniques to jewellery creations.

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 11B.8.1.1: Read and identify project specifications as they pertain to basic construction and soldering.
 - SLO 11B.8.1.2: Read and identify technical information as it pertains to basic construction and soldering.
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GLO 8.2: Apply **mathematics knowledge and skills relevant to jewellery/metalsmithing.**

- SLO 11B.8.2.1: Define units of measurement and tools relevant to the jewellery trade (e.g., metric and imperial measurements, weights and volumes, gauges) as they pertain to basic construction and soldering.
 - SLO 11B.8.2.2: Demonstrate the use of basic geometry as it pertains to basic construction and soldering.
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GLO 8.3: Apply **science knowledge and skills relevant to jewellery/metalsmithing.**

- SLO 11B.8.3.1: Demonstrate an understanding of metal expansion and contraction as related to work hardening, annealing, melting, and porosity of cast metal.
 - SLO 11B.8.3.2: Demonstrate an understanding of oxides as they relate to basic construction and soldering.
 - SLO 11B.8.3.2: Demonstrate the prevention and removal of oxides as they pertain to basic construction and soldering.
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GLO 8.4: Apply **art knowledge and skills relevant to jewellery/metalsmithing.**

- SLO 11B.8.4.1: Demonstrate the creation of a design for project use in basic construction and soldering.
 - SLO 11B.8.4.2: Discuss and apply design elements as they pertain to basic construction and soldering.
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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 11B.8.5.1: Demonstrate the use of Internet for design development and technical information as it pertains to basic construction and soldering.
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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.

No applicable SLOs.

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

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

SLO 11B.10.1.1: Identify ergonomics and repetitive movement strains as they pertain to basic construction and soldering.

SLO 11B.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 basic construction and soldering.

SLO 11B.10.1.3: Discuss the impact on health of metal and material allergies, dust, and toxicities as it pertains to basic construction and soldering.

SLO 11B.10.1.4: Demonstrate the proper use of equipment and tools to prevent repetitive strain injuries—ergonomics, as it pertains to basic construction and soldering.

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

SLO 11B.10.2.2: Discuss chemical hazards on the environment as they pertain to basic construction and soldering.

SLO 11B.10.2.2: Describe and apply the efficient use and disposal of materials as it pertains to basic construction and soldering.

SLO 11B.10.2.3: 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 11B.12.1.1: Demonstrate problem-solving skills.

SLO 11B.12.1.2: Demonstrate critical-thinking skills.

SLO 11B.12.1.3: Demonstrate regular attendance and punctuality.

SLO 11B.12.1.4: Demonstrate accountability by taking responsibility for one's actions.

SLO 11B.12.1.5: Demonstrate adaptability, initiative, and effort.

SLO 11B.12.1.6: Demonstrate the ability to accept and follow direction and feedback.

SLO 11B.12.1.7: Demonstrate teamwork skills.

SLO 11B.12.1.8: Demonstrate the ability to stay on task and use class and studio time effectively.

SLO 11B.12.1.9: Demonstrate the ability to communicate respectfully and effectively with co-workers and customers.

SLO 11B.12.1.10: Demonstrate the ability to maintain an organized work area and use equipment, tools, and materials respectfully.

SLO 11B.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.

No applicable SLOs.

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 11B.13.1.1: Discuss the evolution and technological progression of, and the emerging trends in the jewellery trade as they pertain to basic construction and soldering.

SLO 11B.13.1.2: Demonstrate the use of new technology as it pertains to basic construction and soldering.
