



8823

FORGING AND
FORMING (11C)

30S/30E/30M

A Jewellery/Metalsmithing Course

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Course Description

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

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

SLO 11C.2.3.1: Demonstrate the appropriate disposal and/or recycling of materials and supplies as it pertains to forging and forming.

SLO 11C.2.3.2: Demonstrate the appropriate storage of materials and supplies as it pertains to forging and forming.

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

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

SLO 11C.3.1.1: Demonstrate an understanding of metallurgy as it pertains to forging and forming.

SLO 11C.3.1.2: Define the terminology for descriptive characteristics and properties of metals as it pertains to forging and forming.

SLO 11C.3.1.3: Define the characteristics of metals as they pertain to forging and forming.

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

SLO 11C.3.2.1: Discuss the styles of stone cuts as well as cabochon stone style.

SLO 11C.3.2.2: Demonstrate precautions and the appropriate care of gem materials.

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

SLO 11C.3.3.1: Demonstrate the principles of material characteristics in construction processes as they pertain to forging and forming.

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

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

- SLO 11C.4.1.1: Identify the design problems related to forging and forming.
- SLO 11C.4.1.2: Research the factors that influence design as they pertain to forging and forming.
- SLO 11C.4.1.3: Recognize and apply the elements of design as they pertain to forging and forming.
- SLO 11C.4.1.4: Identify the function of the design as it pertains to forging and forming.
- SLO 11C.4.1.5: Identify the limitations of the materials used in forging and forming.
- SLO 11C.4.1.6: Develop concept drawings for construction based on design criteria related to forging and forming.

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 11C.5.1.1: Demonstrate the basic operation of tools and equipment used in jewellery construction using sheet and wire as it pertains to forging and forming.
- SLO 11C.5.1.2: Demonstrate the forming of hollow ring constructions using patterns.
- SLO 11C.5.1.3: Demonstrate the production of sheet from ingots using a rolling mill.
- SLO 11C.5.1.4: Demonstrate the production of wire from ingots using a rolling mill and drawplates.
- SLO 11C.5.1.5: Demonstrate the safe and appropriate use of the pickle pot.
- SLO 11C.5.1.6: Demonstrate the forming of metal on stakes, anvils, metal blocks, mandrels, and swage blocks.
- SLO 11C.5.1.7: Demonstrate the forming of domes with dapping tools and a block.
- SLO 11C.5.1.8: Demonstrate wire work forming with pliers as it pertains to forging and forming.
- SLO 11C.5.1.9: Demonstrate the forging of wire with hammers as it pertains to forging and forming.
- SLO 11C.5.1.10: Demonstrate die forming with a hydraulic press.
- SLO 11C.5.1.11: Demonstrate the chase and repousse technique.

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 11C.5.3.1: Define terminology for findings and jewellery items as it relates to forging and forming.

SLO 11C.5.3.2: Incorporate findings into construction as they pertain to forging and forming.

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

SLO 11C.5.4.1: Demonstrate the setting of cabochon stones in constructed and soldered bezel.

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

SLO 11C.5.5.1: Define production and benefits to trade as they pertain to forging and forming.

SLO 11C.5.5.2: Demonstrate the production process when cutting multiples of pattern pieces as it pertains to forging and forming.

SLO 11C.5.5.3: Demonstrate the organization of work for the finishing process as it pertains to forging and forming.

SLO 11C.5.5.4: Demonstrate the use of a wire jig to form ear-wires.

SLO 11C.5.5.5: Demonstrate the production of die-formed pieces.

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 11C.6.1.1: Identify the sequence of the finishing steps leading up to polishing as they pertain to forging and forming.

SLO 11C.6.1.2: Identify the tools and equipment used in finishing jewellery as they pertain to forging and forming.

SLO 11C.6.1.3: Demonstrate the sequence of finishing steps as they pertain to metal type, technique, and jewellery design as it relates to forging and forming.

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

SLO 11C.6.2.1: Identify the sequence of polishing techniques as it pertains to forging and forming.

SLO 11C.6.2.2: Select the sequence of polishing techniques as they pertain to metal type, technique, and jewellery design as it relates to forging and forming.

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

SLO 11C.6.3.1: Identify hand tools and techniques for texturing used in forging and forming.

SLO 11C.6.3.2: Demonstrate textural finishing techniques with hammers and chasing tools as they pertain to forging and forming.

SLO 11C.6.3.3: Demonstrate the use of burs/flex-shafts to engrave and texture metal as it pertains to forging and forming.

SLO 11C.6.3.4: Demonstrate the use of patinas as it pertains to forging and forming.

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 11C.7.1.1: Identify situations in which jewellery would require adjustments, modifications, or repairs as they pertain to forging and forming.

GLO 7.2: Adjust jewellery.

SLO 11C.7.2.1: Recognize and apply simple adjustments to the design and function of jewellery creations as they pertain to forging and forming.

GLO 7.3: Modify jewellery.

SLO 11C.7.3.1: Demonstrate an understanding of forging and forming when performing modifications to jewellery creations.

GLO 7.4: Repair jewellery.

SLO 11C.7.4.1: Demonstrate and understanding of forging and forming 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 11C.8.1.1: Read and identify project specifications as they pertain to forging and forming.

SLO 11C.8.1.2: Read and identify technical information as it pertains to forging and forming.

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

SLO 11C.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 forging and forming.

SLO 11C.8.2.2: Demonstrate the use of basic geometry as it pertains to forging and forming.

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

SLO 11C.8.3.1: Demonstrate an understanding of metal expansion and contraction as related to work hardening, annealing, melting, and porosity of forged and formed metal.

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

SLO 11C.8.4.1: Demonstrate the creation of a design for project use in forging and forming.

SLO 11C.8.4.2: Discuss and apply design elements as they pertain to forging and forming.

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 11C.8.5.1: Demonstrate the use of Internet for design development and technical information as it pertains to forging and forming.

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 **sustainability** on the health and well-being of metalsmiths and their clients.

SLO 11C.10.1.1: Identify ergonomics and repetitive movement strains as they pertain to forging and forming.

SLO 11C.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 forging and forming.

SLO 11C.10.1.3: Discuss the impact on health of metal and material allergies, dust, and toxicities as it pertains to forging and forming.

SLO 11C.10.1.4: Demonstrate the proper use of equipment and tools to prevent repetitive strain injuries—ergonomics, as it pertains to forging and forming.

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

SLO 11C.10.2.1: Discuss chemical hazards on the environment as they pertain to forging and forming.

SLO 11C.10.2.2: Describe and apply the efficient use and disposal of materials as it pertains to forging and forming.

SLO 11C.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 11C.12.1.1: Demonstrate problem-solving skills.

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

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

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

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

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

SLO 11C.12.1.7: Demonstrate teamwork skills.

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

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

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

SLO 11C.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 11C.13.1.1: Discuss the evolution and technological progression of, and the emerging trends in the jewellery trade as they pertain to forging and forming.

SLO 11C.13.1.2: Demonstrate the use of new technology as it pertains to forging and forming.
