The Metropolitan State University of Denver
Digital Badge Bulletin

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For any questions, concerns, or assistance, please contact badging@msudenver.edu
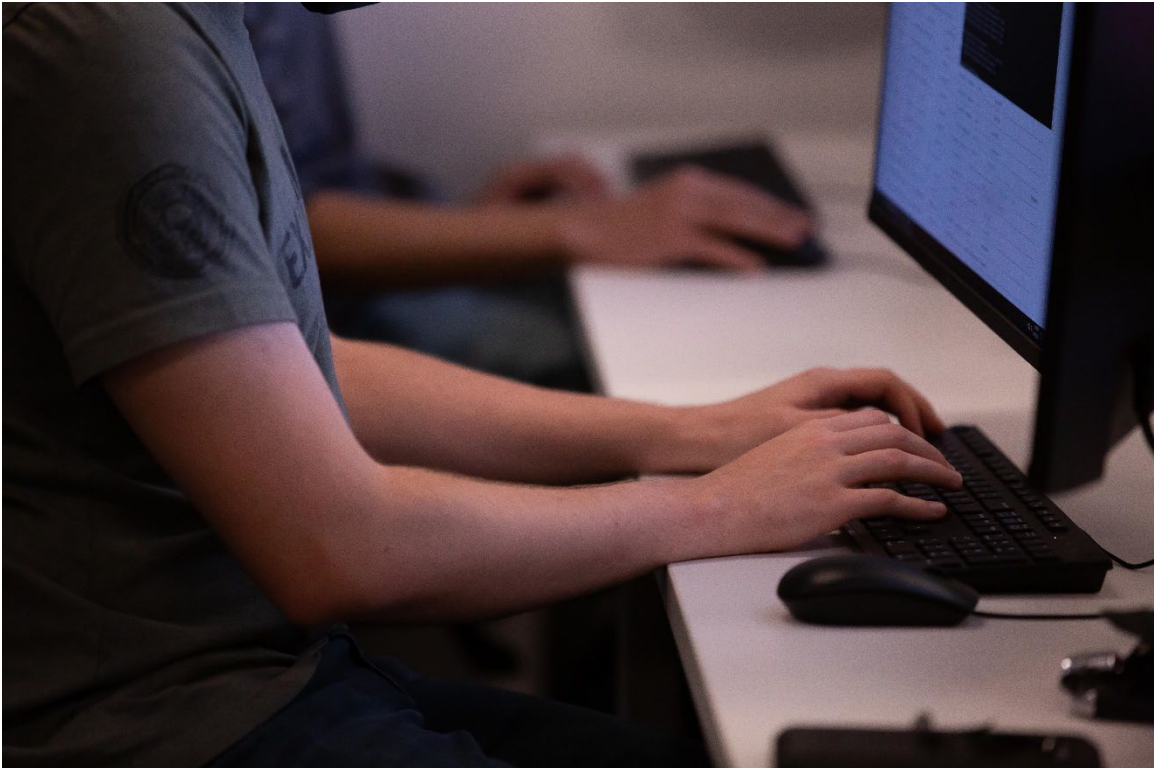
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Department of Art

Visual Literacy Digital Badge

Contact Information

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The **Visual Literacy** digital badge is a competency badge offered through a collaboration of faculty in the MSU Denver Department of Art and Department of English. Earning this badge demonstrates an individual's ability to understand and interpret visual imagery and to communicate their interpretations effectively in writing. Content and skills are learned and demonstrated through academic coursework.

Earning Criteria

Participants earning this badge are required to submit a written formal analysis of a work of art, design or architecture; write an effective interpretation of an example of visual culture in a research paper; and conduct a rhetorical analysis of an example of visual culture.

Competencies Demonstrated

1. Understand and describe the elements and principles of design as articulated in an example of visual culture.
2. Analyze a work of art, design, or architecture based on aesthetic principles.
3. Communicate an analysis in written form.
4. Create effective interpretations of visual culture using critical frameworks and art historical methodologies.
5. Relate social and cultural contexts to the meaning of an example of visual culture using art historical methodologies.
6. Compose a rhetorical analysis on an element or concrete aspect of visual text.
7. Analyze how rhetoric relates to historical and cultural contexts of a visual text.
8. Apply an argument and method of interpretation to an everyday visual text and/or the visual material of everyday.

Department of Aviation and Aerospace Science

Uncrewed Aircraft Systems (UAS) Basic Flight Operations Digital Badge

Contact Information

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The **Uncrewed Aircraft Systems (UAS) Basic Flight Operations** badge is an achievement badge offered through the Department of Aviation and Aerospace Science. Completing this badge demonstrates the proper knowledge of how UAS can be safely and effectively operated in a private environment. Commercial drone operation concepts are also introduced.

Earning Criteria

Participants earning this badge are required to complete an online FAA course related to assessing safe UAS operating environments, demonstrate safe flight operation of a drone, and plan and navigate a UAS flight operation.

Competencies Demonstrated

1. Completion of FAA safety course.
2. Demonstrate safe battery charging practices, set up and break down of drone and components.
3. Apply proper set up of operation areas with safety measures in place.
4. Demonstrate safe flight with callouts as pilot in command (PIC), control of aircraft, and basic flight maneuvers.
5. Understand proper compass calibration of UAV.
6. Apply mission planning for UAV flight operations.
7. Understand flight documentation and logging all relevant areas.
8. Understand the process to successfully plan, execute, and log a UAS aerial photographic mission.
9. Understand how UAS are used in commercial and entrepreneurial applications.

Department of Chemistry and Biochemistry

Analytical Chemistry Lab Skills Digital Badge

Contact Information

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The **Analytical Chemistry Lab Skills** badge is a competency badge offered by the Department of Chemistry and Biochemistry. This culminating badge showcases content and skills in pipette calibration, verifying a calibration model, standardizing a base by titration, and spectroscopically determining dye concentration. Competencies are demonstrated through academic coursework in an analytical chemistry laboratory setting.

Earning Criteria

Participants earning this badge have demonstrated a breadth of analytical chemistry lab skills through their completion of the following set of four badges in an analytical chemistry laboratory setting: Pipette Calibration, Verifying a Calibration Model, Standardizing a Base by Titration, and Spectroscopically Determining Dye Concentration.

Competencies Demonstrated

1. Choose the appropriate tip for the micropipette.

2. Demonstrate proper technique using a micropipette.
3. Calculate the sample standard deviation of the ten trials for each volume tested.
4. Solve for the coefficient of variation (CV%) and inaccuracy (A%).
5. Evaluate if the coefficient of variation is within the manufacturer's specifications.
6. Evaluate if the accuracy is within the manufacturer's specifications.
7. Operate an analytical balance to weigh a standard accurately.
8. Calculate the amount of stock solution needed to prepare calibration standards.
9. Use volumetric glassware to achieve the required final volume of solution.
10. Create a linear calibration model in a spreadsheet program
11. Evaluate the coefficient of determination (R2 value) and ensure it has a value of 0.99 or greater
12. Construct a residual plot from values derived using the calibration model.
13. Judge if the error in the signal of the calibrators is randomly distributed.
14. Analyze an external control and use the calibration model to determine its concentration.
15. Calculate the percent error and ensure it is less than 10%.
16. Use an analytical balance to accurately weigh a primary standard.
17. Perform a titration for at least three trials, or until a precision of 1% relative standard deviation is achieved.
18. Calculate the concentration of base.
19. Solve for the sample standard deviation, average, and percent relative standard deviation.
20. Report final values to the correct number of significant figures.
21. Calculate the percent error for the average concentration. This percent error must be less than or equal to 10%. If this benchmark is not met, the student will have another opportunity to collect more data if they choose.
22. Compare the standard deviation to the uncertainty of the concentration.
23. Evaluate in a written statement if the results are both accurate and precise.
24. Use volumetric glassware and a micropipette to make calibration standards of two dyes.
25. Operate a spectrometer to measure the absorbance of each standard.
26. Calculate the molar absorptivity for each dye at the chosen wavelengths.
27. Measure the absorbance of the control at the five chosen wavelengths.
28. Employ Excel's Solver tool to approximate the concentration of each dye.
29. Estimate the concentration of a control. An accuracy of at least 10% is required.
30. Measure the absorbance of the commercial beverage at the five chosen wavelengths.
31. Create a mock beverage and spectroscopically compare the mock beverage to the commercial beverage.

Pipette Calibration Digital Badge

Contact Information

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The **Pipette Calibration** badge is a competency badge offered by the Department of Chemistry and Biochemistry. Micropipette content and skills are learned and demonstrated through academic coursework in an analytical chemistry laboratory setting.

Earning Criteria

Participants earning this badge are required to demonstrate pipetting skills in a laboratory setting, collect and calculate their data in electronic spreadsheets, and provide evidence of the precision and accuracy of their data within tolerances of the pipette manufacturer's specifications.

Competencies Demonstrated

1. Choose the appropriate tip for the micropipette.
2. Demonstrate proper technique using a micropipette.
3. Calculate the sample standard deviation of the ten trials for each volume tested.
4. Solve for the coefficient of variation (CV%) and inaccuracy (A%).
5. Evaluate if the coefficient of variation is within the manufacturer's specifications.
6. Evaluate if the accuracy is within the manufacturer's specifications.

Protein Structure Visualization and Ligand Docking Digital Badge

Contact Information

Department of Chemistry and Biochemistry   Andrew McMillan: amcmill3@msudenver.edu

The **Protein Structure Visualization and Ligand Docking** badge is a competency badge offered through the Department of Chemistry and Biochemistry. Completing this badge demonstrates foundational knowledge in the use of the Protein Data Bank (PDB) to obtain information about protein structures, customize visualizations of the proteins, and use docking models to understand protein-ligand interactions.

Earning Criteria

Participants earning this badge are required to demonstrate effective use of the Protein Data Bank (PDB) website, describe the contents of a PDB text file, analyze a protein structure, create a customized image of a protein, and predict and interpret protein-ligand interactions by creating a docking model.

Competencies Demonstrated

1. Provide resolution and method of determining structure for a given Protein Data Bank (PDB) entry.
2. Describe general levels of detail that can be seen at different levels of resolution.
3. Identify publication associated with structure.
4. Provide residue identifier names for non-protein molecules in structure.
5. Explain what details are provided by the atom coordinate line in a PDB text file.
6. Customize colors of specific residues.
7. Adjust representation of atom type and secondary structure backbone of specific parts of protein.
8. Select region based on distance to atom and customize display.
9. Measure distance between atoms.
10. Save publication quality images with orientation to see important features.
11. Save structure viewer session file.
12. Identify molecules that could be used to mimic natural substrate and describe how differences and similarities may affect interaction with the receptor protein.
13. Explain features of "best" conformation from a docking model output and why it was selected.
14. Describe significance of alternative conformations.

Spectroscopically Determining Dye Concentration Digital Badge

Contact Information

The **Spectroscopically Determining Dye Concentration** badge is a competency badge offered by the Department of Chemistry and Biochemistry. Quantitative spectroscopy content and skills are learned and demonstrated through academic coursework in an analytical chemistry laboratory setting.

Earning Criteria

Participants earning this badge are required to construct calibration models for two dyes, perform regression analysis to approximate the concentration of the dyes, assess the concentration of two dyes in a commercial beverage product, and recreate the same absorption in a mock product.

Competencies Demonstrated

1. Use volumetric glassware and a micropipette to make calibration standards of two dyes.
2. Operate a spectrometer to measure the absorbance of each standard.
3. Calculate the molar absorptivity for each dye at the chosen wavelengths.
4. Measure the absorbance of the control at the five chosen wavelengths.
5. Employ Excel's Solver tool to approximate the concentration of each dye.
6. Estimate the concentration of a control. An accuracy of at least 10% is required.
7. Measure the absorbance of the commercial beverage at the five chosen wavelengths.
8. Create a mock beverage and spectroscopically compare the mock beverage to the commercial beverage.

Standardizing a Base by Titration Digital Badge

Contact Information

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The **Standardizing a Base by Titration** badge is a competency badge offered by the Department of Chemistry and Biochemistry. Content and skills are learned and demonstrated through academic coursework in an analytical chemistry laboratory setting.

Earning Criteria

Participants earning this badge are required to titrate a primary standard to determine its molarity and confirm the precision and accuracy of their data within established tolerance levels.

Competencies Demonstrated

1. Use an analytical balance to accurately weigh a primary standard.
2. Perform a titration for at least three trials, or until a precision of 1% relative standard deviation is achieved.
3. Calculate the concentration of base.
4. Solve for the sample standard deviation, average, and percent relative standard deviation.
5. Report final values to the correct number of significant figures.
6. Calculate the percent error for the average concentration. This percent error must be less than or equal to 10%. If this benchmark is not met, the student will have another opportunity to collect more data if they choose.

7. Compare the standard deviation to the uncertainty of the concentration.
8. Evaluate in a written statement if the results are both accurate and precise.

Sterile Technique for Bacterial Culturing Digital Badge

Contact Information

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The **Sterile Technique for Bacterial Culturing** badge is a competency badge offered through the Department of Chemistry and Biochemistry. Completing this badge demonstrates the proper handling of sterile materials and bacterial cultures in a biochemical laboratory setting.

Earning Criteria

Participants earning this badge are required to demonstrate appropriate laboratory safety skills and the effective transfer of media, inoculate liquid media with a bacterial culture, and streak bacterial culture on solid plates to isolate individual bacterial colonies.

Competencies Demonstrated

1. Use aseptic techniques, including the use of appropriate personal protective equipment, to complete tasks while avoiding contamination from the body or laboratory environment.
2. Use serological pipette to accurately dispense media into culture tube.
3. Inoculate bacteria into fresh liquid media and incubate for growth.
4. Obtain isolated colonies by streaking from a broth bacterial culture onto the surface of an agar plate.
5. Obtain isolated colonies by re-streaking from a previously-grown bacterial colony onto the surface of an agar plate.

Verifying a Calibration Model Digital Badge

Contact Information

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The **Verifying a Calibration Model** badge is a competency badge offered by the Department of Chemistry and Biochemistry. Content and skills are learned and demonstrated through academic coursework in an analytical chemistry laboratory setting.

Earning Criteria

Participants earning this badge are required to prepare a stock solution and calibration standards, create a linear calibration model with residual plot, submit a narrative discussion of the fitness of their calibration model, and analyze tolerance of data for an external control.

Competencies Demonstrated

1. Operate an analytical balance to weigh a standard accurately.
2. Calculate the amount of stock solution needed to prepare calibration standards.
3. Use volumetric glassware to achieve the required final volume of solution.
4. Create a linear calibration model in a spreadsheet program
5. Evaluate the coefficient of determination (R^2 value) and ensure it has a value of 0.99 or greater
6. Construct a residual plot from values derived using the calibration model.
7. Judge if the error in the signal of the calibrators is randomly distributed.
8. Analyze an external control and use the calibration model to determine its concentration.
9. Calculate the percent error and ensure it is less than 10%.

Department of Health Professions

Aging Services Digital Badge

Contact Information

Department of Health Professions   Amy Dore: dorea@msudenver.edu

The **Aging Services** badge is a competency badge offered by the Department of Health Professions. While not clinical in nature, the Aging Services badge provides content required of all employees working in the Long-Term Care field.

Earning Criteria

Participants earning this badge are required to meet with a faculty advisor specializing in aging services in the Department of Health Professions. Students will submit academic coursework related to aging services and long-term care, a public awareness campaign, and reflect on an immersive aging services experience (e.g., workshop, interview, panel discussion). Additionally, participants will complete Ageism First Aid (AFA) training offered by The Gerontological Society of America.

Competencies Demonstrated

1. Academic planning with a faculty advisor.
2. Career planning with a faculty advisor.
3. Identify characteristics and needs of older adults.
4. Describe shifts in population aging.
5. Investigate common health disparities.
6. Distinguish the differences between ageism and ableism and apply examples of each.
7. Recognize myths and stereotypes related to ageism and ableism.
8. Demonstrate essential vocabulary for discussing ageism and ableism.
9. Acknowledge the social stigmatization connected to ageism and ableism.
10. Learn specific/nuanced interpersonal communication skills for interacting with older adults and/or those working in the aging services field (i.e., tone, noise level, jargon, acronyms, etc.)
11. Demonstrate knowledge of current trends and issues facing residents and/or employees living or working in aging services.
12. Investigate aging services career roles and /or needs of older persons as they age.
13. Develop a personal plan for future participation in the care of aging adults.
14. Completion of Ageism First Aid (AFA) training from The Gerontological Society of America.

Men's Health Digital Badge

Contact Information

Department of Health Professions   Steve Rissman: srissman@msudenver.edu

The **Men's Health** badge is a competency badge offered through the Department of Health Professions. Earning this badge demonstrates expertise in understanding the social, emotional, and psychological issues affecting men's health behaviors. While not clinical in nature, it is intended to prepare participants for working with boys and men in workplace contexts such as public health, healthcare, lifestyle medicine, wellness coaching, social work, education, criminal justice, and emergency response.

Earning Criteria

Participants earning this badge are required to submit academic works demonstrating foundational understanding of issues impacting the health of men and boys, communicating with males, masculine discourse and health, and ways of engaging in the men's health field.

Competencies Demonstrated

1. Academic and career planning with a faculty advisor.
2. Identify gender-specific morbidities and mortalities affecting boys/men across cultures.
3. Explore creative ways to engage boys and men in their health process.
4. Investigate health disparities across cultures of men.
5. Acknowledge detrimental and beneficial health behaviors associated with traditional masculine norms.
6. Amass a personal library of resources, including books, videos, and scholarly articles that inspire an interest in men's well-being.
7. Articulate the intersection of masculine norms and aging in men.
8. Develop interpersonal communication skills for interacting with men.
9. Demonstrate knowledge of current trends and issues facing men across the life span.
10. Demonstrate professionalism through engagement with the American College of Lifestyle Medicine's Men's Health Member Interest Group, American Men's Studies Association, or similar associations in the Men's Health field.

Department of Nursing

Nursing Excellence Digital Badge

Contact Information

Department of Nursing   Jill Todd: jtodd32@msudenver.edu

The Nursing Excellence badge is a competency badge offered through the Department of Nursing. Earning this badge demonstrates the completion of nursing excellence training and professional development informed by industry leader ANCC Magnet® Recognition programming. It is intended to prepare participants for work in hospitals/facilities nationwide that are seeking and/or maintaining ANCC Magnet® Recognition programming.

Earning Criteria

Participants earning this badge are required to submit academic works demonstrating the ability to critically research evidence-based clinical nursing practice, showcase EHR documentation skills and use informatics to inform patient care, interpret change theory and its application in clinical practice, and how quality and safety directs professional patient care and outcomes.

Competencies Demonstrated

1. Use critical thinking to critique research studies to determine the applicability of evidence-based nursing practice.
2. Demonstrate and use appropriate databases for conducting literature reviews for applying evidence to clinical practice.
3. Examine how safety, quality of care, and cost-effectiveness can be improved in health care.
4. Utilize technologies that support clinical decision-making, error prevention, and care coordination.
5. Demonstrate proficiency in EHR data entry, extraction, and management.
6. Utilize standardized measurement tools to identify documentation compliance.
7. Apply concepts of quality and safety using structure, process, and outcome measures to identify clinical questions.
8. Apply QSEN competencies and Magnet® components to nursing practice leadership.
9. Select and appraise change theories to influence patient outcomes.
10. Evaluate the impact care delivery has on the safety and quality of care in the healthcare environment.
11. Analyze the effectiveness of the quality improvement process to improve patient outcomes.
12. Evaluate the use of QSEN competencies in health care settings.
13. Illustrate the interdependence between the Magnet® model, the professional Registered Nurse role, and quality patient outcomes in a health care setting.

Gender Institute for Teaching and Advocacy

Social Justice and Advocacy Digital Badge

Contact Information

Gender Institute for Teaching and Technology   Anahi Russo Garrido: arusso8@msudenver.edu

The **Social Justice and Advocacy** badge is a competency badge offered through a collaboration of the Gender Institute for Teaching Advocacy (GITA) and the departments of Africana Studies (AAS) and Chicana/o Studies (CHS). Completing this badge demonstrates foundational knowledge in social justice and advocacy education learned through academic coursework and by attending a series of events offered by GITA, AAS, or CHS. Students learn to interrogate power, structural inequalities, and oppression in community and organizational settings, and to develop strategies toward transformation and social change.

Earning Criteria

Participants earning this badge are required to submit written works related to social justice and advocacy, including issues in community and organizational settings; attend three events sponsored by GITA, AAS, or CHS - including a

performance, exhibit, keynote speech, invited or distinguished lecture, talk, panel discussion, film screening, or workshop; and submit a capstone essay, creative project, or reflection on community engagement activities.

Competencies Demonstrated

1. Identify issues that create systemic inequities in communities and organizations.
2. Develop a social justice and advocacy perspective using concepts from Ethnic and Gender Studies.
3. Discuss basic legal and ethical issues of advocacy work.
4. Analyze a specific social justice issue.
5. Demonstrate knowledge regarding social justice and advocacy issues.
6. Identify strategies to address social justice issues in community and organizational settings.
7. Recognize current social justice and advocacy issues in one's community.
8. Illustrate how issues of social justice and advocacy may be addressed through performative, political, cultural, and/or other community events.
9. Describe how key Ethnic Studies and Gender Studies concepts address structural inequalities.
10. Apply social justice frameworks to analyzing systemic barriers and challenges in community and organizational settings.
11. Adapt principles of social justice towards various workplace and community settings.
12. Design strategies to address social justice issues in community and organizational settings.
13. Investigate and evaluate a specific issue related to social justice and advocacy in an original project.
14. Deliver a presentation for a public audience or engage with community members through 12 hours of volunteer activity.