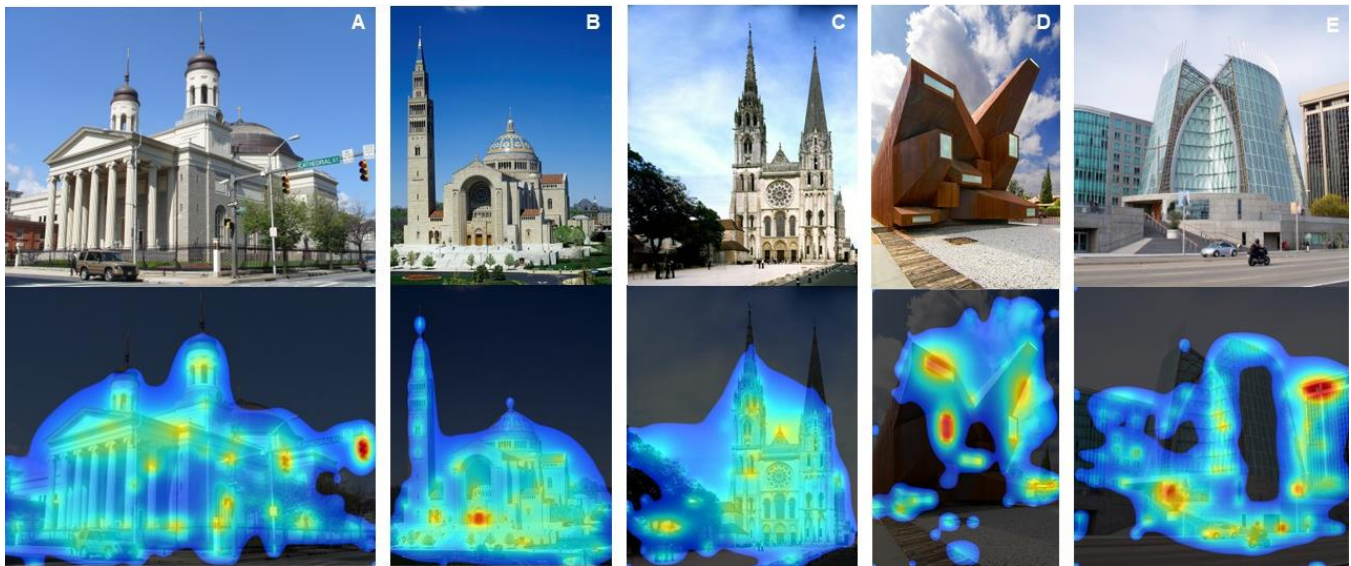


# ARCHITECTURE RESEARCH PROJECT

ARC 4530 | Culture & Behavior in Architecture | Prof. Brandon Ro, AIA, NCARB



3M Visual Attention Software (VAS) study with region of interest (ROI) diagrams. Heatmaps help illustrate predictive biometric data of where people spend their time looking. *Image credit: Brandon R. Ro, "Beauty and Transcendence in Architecture: Four Ideals for the Secular Age." In Proceedings of the 2022 CAVAD Architecture Symposium – Imagination, Transcendence, and the Secular Age. Riverside, CA: California Baptist University, 2022.*

[https://www.academia.edu/93361852/Beauty\\_and\\_Transcendence\\_in\\_Architecture\\_Four\\_Ideals\\_for\\_the\\_Secular\\_Age](https://www.academia.edu/93361852/Beauty_and_Transcendence_in_Architecture_Four_Ideals_for_the_Secular_Age)

## REQUIREMENTS

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### PURPOSE

The Architecture Research Project is designed to demonstrate each student's ability to engage in research about the aesthetic experience of architecture from a cognitive, behavioral, and emotional viewpoint. In this context, architectural research is defined as an inquiry or investigation conducted by a student that makes an original intellectual or creative contribution to the discipline. The ultimate deliverable for the research project will be to compile and synthesize the findings in either a written **paper** or as a **poster** presentation. The research will be presented to the class as well as at a professional academic conference. Students have the option to work individually or with a partner on this research project. The instructor will serve as the research mentor who supervises the project by providing guidance, support, evaluation, and review (see "Research Project Roles and Expectations" below).

## CONFERENCE OPPORTUNITIES

### 2024 Annual Conference of the Utah Academy of Sciences, Arts, and Letters

- <https://www.utahacademy.org/call-for-papers/>
- When: March 23, 2024
- Poster / Oral Presentation Abstracts due: February 16
- Abstract length: 300 words max
- Paper length for journal (June 1): 10 and 20 double-spaced pages

### 2024 Intermountain Engineering, Technology and Computing (i-ETC) Conference

- <https://www.uvu.edu/cet/i-etc/papers/>
- When: May 13-14, 2024
- Full Paper due: February 17
- Poster Abstract due: March 29
- Abstract length: 300 words minimum up to 1 page
- Paper length: 6 pages single spaced maximum

## RESEARCH PROJECT TOPICS

Students will select a topic from the weekly readings, previous research in architectural theory, or new topics as approved by the instructor. Possible research topics may include:

- Architectural research for practice
- Cultural expression in architecture
- Spirituality in architecture
- Cognitive issues in architecture
- Behavioral science for architecture
- Architecture for the senses
- Emotion in architecture
- Psychological dimensions of architecture
- Thigmotaxis (edge-hugging) in architecture
- Pattern languages, faces, and spaces
- Shapes, symmetry, hierarchy, curves, complexity
- Beauty and the brain
- Biophilia and biomimicry
- Healing spaces

Other topics may be selected outside of this list if approved in advance by the instructor but should be related to the overall theme and content of the class.

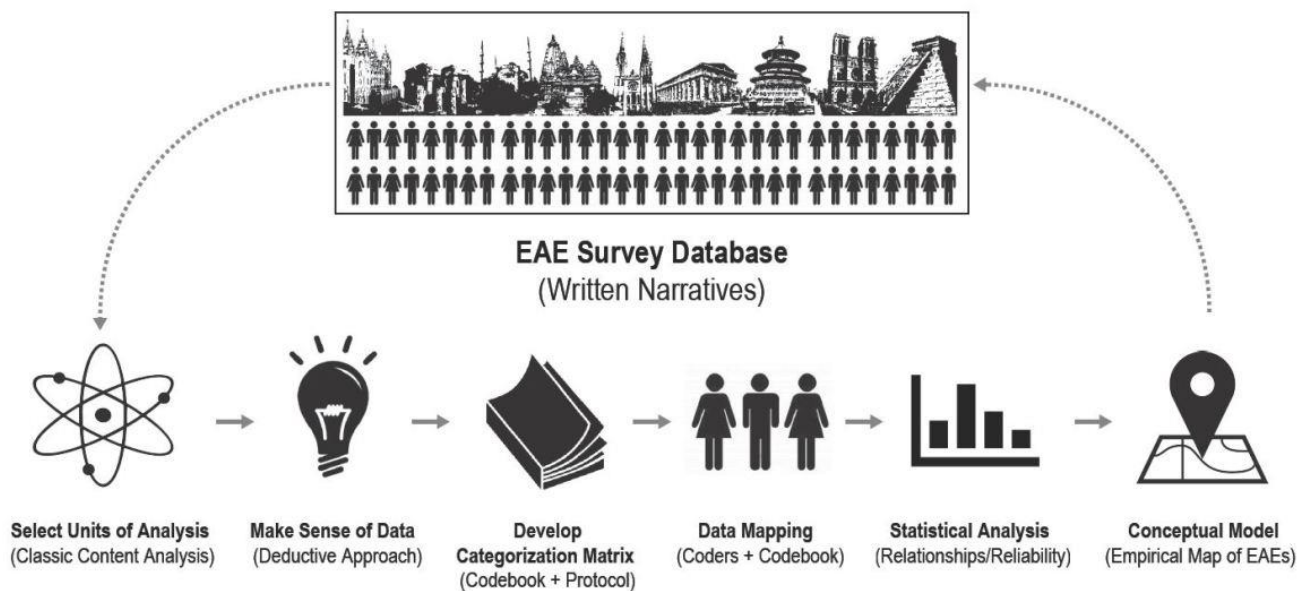
*SPECIAL NOTE: Students interested in using human subjects in their research (e.g., surveys, biometrics) must go through training and fill out an application with UVU's Institutional Review Board:*

<https://www.uvu.edu/irb/application-process/index.html#project>

## ASSESSMENT

Each student will follow several steps over the course of their research project. Students working individually are required to submit a written paper or poster. Students working with a partner are required to create both a poster and a paper. The five steps in this process and their respective assessment are broken down as follows:

<b>ARCHITECTURE RESEARCH PROJECT</b>	<b>20%</b>
Step 1) Research Topic Selection / Research Plan	20 pts
Step 2) Annotated Bibliography	30 pts
Step 3) Part A- Title / Abstract: Rough Draft	20 pts
Part B- Title / Abstract: Final	30 pts
Step 4) Part A- Paper / Poster: Rough Draft	30 pts
Part B- Paper / Poster: Final	50 pts
Step 5) Presentation to Class	20 pts
<b>Total</b>	<b>200 pts</b>



## RESEARCH PROCESS

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### STEP 1: RESEARCH TOPIC SELECTION / RESEARCH PLAN

Students will submit a **1) Preliminary Research Statement & 2) a Research Plan** about their proposed research project topic.

**PART 1:** The **Preliminary Research Statement** should be a minimum three typed paragraphs up to a page. This Preliminary Statement should include a thesis statement of what the student wants to explore with several key points or ideas that will be addressed. The Statement should also mention some of the sources that the student plans to include in their research.

**PART 2:** Each student will also include a **Preliminary Research Plan** in the form of a Gantt chart that outlines the timeline for their research project and how they will meet the class deadlines. Similar to an architectural project schedule with various phases of design (e.g., Schematic Design, Design Development, Construction Documents, etc.), successful research projects will also include several phases or steps in the research process. The phases will vary based on the types of research you are performing, but they typically include the following six steps:

- 1) **Define Objective & Problem** (needs assessment, situation analysis, research problem, hypothesis, research goals, literature review, conceptual framework);
- 2) **Determine Research Design & Planning** (selecting research methods, identify population sample, select measures, research protocol, program design);
- 3) **Design & Prepare Research Instrument** (select measures, research protocol, program design);
- 4) **Implementation** (sampling, data collection, testing, survey, interviews, etc);
- 5) **Evaluation** (processing the results of the study, data analysis, interpretation of findings); and
- 6) **Dissemination** (visualize and communicate results, writing the report, composing graphics, designing poster, presenting the findings, publishing the results).

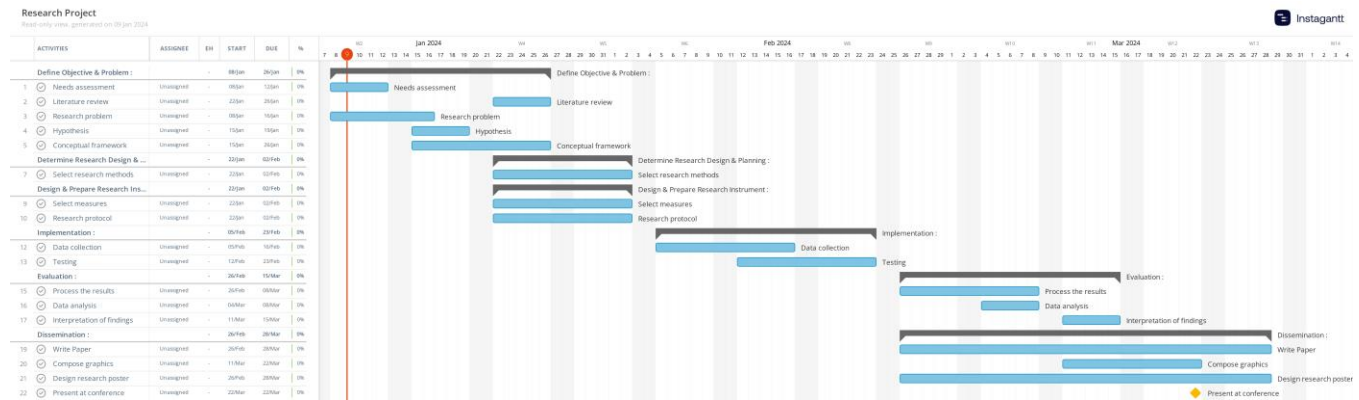
The six steps of research should be included in each student's research plan. The instructor will review these statements and return them with comments and suggestions.

Submit your research topic selection and Gantt chart research plan as a PDF to Canvas. The instructor will review and provide feedback.

## RESOURCES

What is research? How to conduct research?

<https://www.uvu.edu/undergrad-research/student-research/resources.html>



*Example of research plan created in Instagantt.com*

## STEP 2: ANNOTATED BIBLIOGRAPHY

After you have selected your research topic, the next step is to start gathering information about your topic. One means of documenting your research process and the sources you come across along the way is to create an annotated bibliography. Typically, an annotated bibliography is prepared in advance of a research project or paper. A typical annotated bibliography consists of two main things:

- 1) **Citation:** Each source reference will be formatted in a particular bibliographic style (e.g., MLA, APA, Chicago). This is similar to a bibliography or works cited at the end of a research paper.
- 2) **Annotation:** An annotation is a brief summary of the source's content and also includes an evaluation of the points raised by the author, such as the quality of the evidence, their relevance, the author's credibility, and its value to your research project. This is usually three to four sentences in length.

**Each student will create an annotated bibliography for the sources they come across for their research project and submit this as a PDF to Canvas.** The annotated bibliography must include a minimum of five (5) sources. Each source citation will be in Chicago style. After the source citation, students will also include a written annotation that summarizes and evaluates the source for their research.

Below is a link to the UVU Writing Center which has citation style and annotated bibliography guides:

<https://www.uvu.edu/writingcenter/handouts/index.html>

Tompkins, Jane. “Indians: Textualism, Morality, and the Problem of History.” *Critical Inquiry*, vol. 13, no. 1, 1986, pp. 101-119.

Tomkins explores her attempts to uncover the “truth” about historical encounters between Native Americans and European colonists through a personal narrative. Documenting her research process chronologically, Tomkins shows how her perspective changes as she consults historical documents written by first the colonizers and then the colonized. Tomkins ultimately concludes that since no overarching historical narrative exists, students of history must seek out competing versions of history to approximate the truth. This article represents an important contribution to the field of historiography and will figure prominently in my paper’s methodology section.

*Example for UVU Writing Center’s “Annotated Bibliography” handout.*

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### STEP 3: RESEARCH TITLE & ABSTRACT – SUBMIT TO CONFERENCE

Each student will submit both a **research project title/subtitle and an abstract** to the instructor as well as to the selected conference above. An abstract is a short-written description that summarizes the nature of your research project, its results, and highlights any interesting outcomes. You should write the abstract for a non-expert reader that is educated. This step will be completed in two phases:

- 1) rough draft for instructor review/feedback
- 2) final submission to conference and instructor

Students will finalize the research abstract for submission to one of the conferences listed above. Each student will need to carefully follow the guidelines required by each conference as they will be different. The instructor for the course will serve as the faculty mentor/second author for each project as students prepare their work for submission (see “Project Roles and Expectations” below).

Your abstract submission should include the following:

1. **Clearly state the central research question and/or purpose of the project.** What is it that you wish to study? This could be a building typology (i.e. the energy consumption of single family homes vs. duplex units or efficiency of one floor vs. two floor office) or it could be the evolution of a building typology, building material, building system, building technology, a place or an architectural theory.
2. **Provide brief, relevant scholarly or research context that demonstrates its attempt to make a unique contribution to the area of inquiry.** Describe why this research is relevant today. What has changed, is changing, or is likely to change in the future and how might this change effect people, place, design aspirations, building technology, etc.?
3. **Provide a brief description of the research methodology.** How will you conduct the research (i.e. comparative, historic, evolutionary, inductive [analyze the observed phenomenon], deductive [verify an observed phenomenon], qualitative, experimental, simulation, case studies)
4. **State conclusions or expected results and the context in which they will be discussed.** What do you expect the results to be or what do you expect to learn and what is likely to be the significance of your findings?
5. **Include text only (no images or graphics typically, but see conference requirements).** We recognize this may be difficult when you are researching a “thing” in the built environment but do your best.



6. **Be well-written and well-organized.** Follow the script you have been given (#'s 1, 2, 3, & 4 above in this order). Restate each topic and be specific in your response to each. Use complete sentences (bullet points can be used following a statement but never alone). Read what you have written out loud to check to see if it sounds clear and concise. Reread what you have written 24 hours later to identify typos, poor word usage, incomplete sentences, etc. Read what you have written to a friend and ask them if they can restate what you are proposing. If you are the least bit uncertain take what you have written to the writing center.
- **Abstracts length** – see conference requirements.

*Examples of Research Abstracts:*

- Student Abstracts from past UCUR conferences (<https://www.ucur.org/abstracts>)
- Architectural Research Poster Abstracts from the 2013 ARCC Conference (see pp.725-743) [https://brandonro.files.wordpress.com/2020/08/arcc2013\\_poster-abstracts.pdf](https://brandonro.files.wordpress.com/2020/08/arcc2013_poster-abstracts.pdf)

### **PART A: Rough Draft**

**Submit your rough draft research abstract as a Microsoft Word document to Canvas. The instructor will review and provide feedback.**

### **PART B: Final Draft**

**Submit your final research abstract to 1) Canvas as a word document, and 2) to the conference.**

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## **STEP 4: RESEARCH PAPER AND/OR POSTER SUBMISSION**

Step 4 comprises drafting (Part A) and finalizing (Part B) the research paper and/or poster. Each student should incorporate any feedback received from the instructor on their rough draft. Students must make sure the format, size, style, of their paper and/or poster conforms to the guidelines of the particular conference they are submitting to for consideration. The instructor for the course will serve as the faculty mentor/second author for each project as students prepare their work for submission (see “Project Roles and Expectations” below).

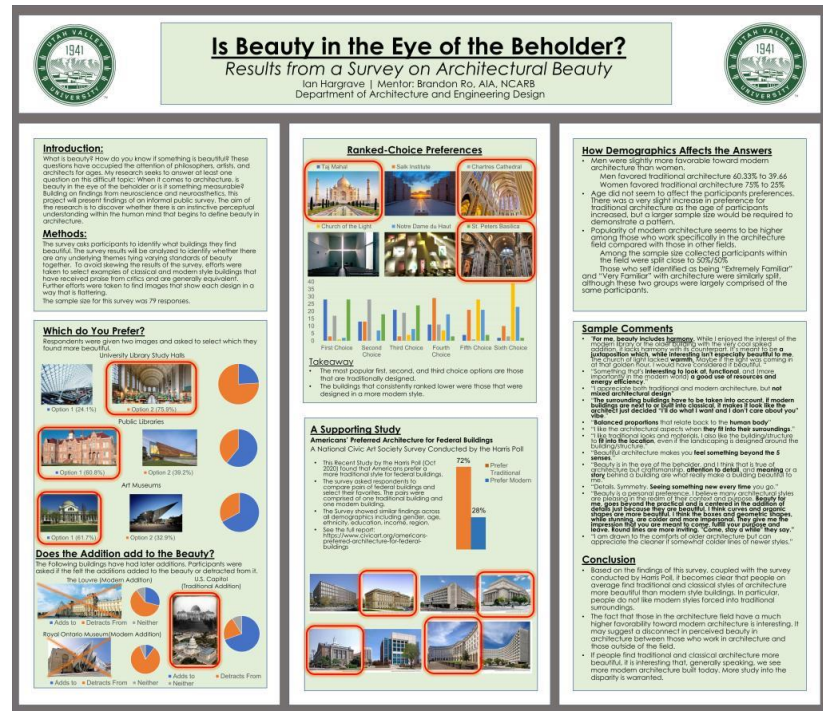
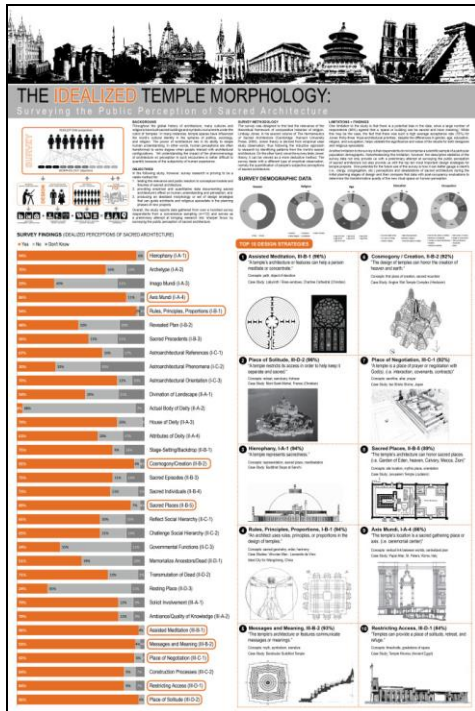
Similar to the research abstract, the paper/poster should include the following sections:

1. **INTRODUCTION: Clearly state the central research question and/or purpose of the project.** What is it that you wish to study? This could be a building typology (i.e. the energy consumption of single family homes vs. duplex units or efficiency of one floor vs. two floor office) or it could be the evolution of a building typology, building material, building system, building technology, a place or an architectural theory.
2. **Provide brief, relevant scholarly or research context that demonstrates its attempt to make a unique contribution to the area of inquiry.** Describe why this research is relevant today. What has changed, is changing, or is likely to change in the future and how might this change effect people, place, design aspirations, building technology, etc.?
3. **METHODOLOGY: Provide a brief description of the research methodology.** How will you conduct the research (i.e. comparative, historic, evolutionary, inductive [analyze the observed phenomenon], deductive [verify an observed phenomenon], qualitative, experimental, simulation, case studies)
4. **RESULTS:** What were the results of the experiment/project?
5. **DISCUSSION:** What is significant about the findings?
6. **CONCLUSION:** State conclusions, limitations, next steps.

Each student developing a poster should follow the general guidelines below:

- Poster size – see conference.
- Include abstract on the poster.
- Include working bibliography of sources used for the research.
- Posters must be readable from three feet away.
- Poster should include:
  - presentation title
  - student name
  - research advisor name
  - school
  - department

Below are examples of research poster layouts.



## PART A: Rough Draft

Submit your rough draft research paper as a Microsoft Word and/or poster as a PDF document to Canvas. The instructor will review and provide feedback.

## PART B: Final Draft

Submit your final research paper to 1) Canvas as a word document/poster as a PDF, and 2) to the conference.

## STEP 5: PRESENTATION TO CLASS

Each student will have ten to fifteen (10-15) minutes to present their architecture research project and poster to the class. Students will want to explain the following during their presentation:

- Clearly state the central research question and/or purpose of the project.
- Provide brief, relevant scholarly or research context that demonstrate its attempt to make a unique contribution to the area of inquiry.

- Provide a brief description of the research methodology.
- State conclusions and significant findings from the project.
- Discuss any limitations to the study.
- Recommend next steps if the research were to continue.

**Submit your PowerPoint presentation to Canvas.**

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## **RESEARCH PROJECT ROLES AND EXPECTATIONS**

Below is an outline of the expectations and roles for both the student and instructor during the research project.

### **Expectations for the Student (First Author):**

- **Research Design and Proposal:**
  - Develop a comprehensive research proposal outlining the objectives, methodology, and expected outcomes of the project.
  - Seek feedback from the mentor to refine and enhance the research design and question.
- **Literature Review:**
  - Conduct a thorough literature review relevant to the research topic.
  - Summarize key findings, identify gaps, and integrate relevant literature into the research context.
- **Data Collection and Analysis:**
  - Independently collect and analyze data according to the approved methodology.
  - Keep detailed records of the data collection process, ensuring accuracy and reliability.
- **Writing and Drafting:**
  - Prepare drafts of the research paper, ensuring clarity, coherence, and adherence to academic writing standards.
  - Revise and incorporate feedback from the mentor to improve the quality of the manuscript.
- **Communication:**
  - Regularly communicate progress to the mentor by sharing updates, challenges, and proposed solutions.
  - Attend scheduled meetings and respond promptly to emails and messages.
- **Critical Thinking:**
  - Demonstrate critical thinking skills in interpreting data, discussing findings, and drawing conclusions.
  - Engage in constructive discussions with the mentor to refine the research approach.
- **Responsibility and Timeliness:**
  - Adhere to project timelines and deadlines.
  - Take responsibility for meeting milestones and completing assigned tasks in a timely manner.

### **Expectations for the Faculty/Instructor (Mentor and Second Author):**

- **Guidance and Support:**
  - Provide guidance and support throughout the research project, especially during the initial stages of proposal development.
  - Offer assistance in navigating challenges and overcoming obstacles.
- **Literature Review Evaluation:**
  - Review and provide feedback on the literature review, ensuring it is comprehensive, well-organized, and relevant to the research topic.
- **Methodology Review:**
  - Review and provide constructive feedback on the research methodology, ensuring its appropriateness for achieving the project objectives.
- **Data Analysis Oversight:**



- Oversee the data analysis process by offering insights and guidance to ensure accuracy and robust interpretation of results.
- **Manuscript Review:**
  - Review drafts of the research abstract, poster, and/or paper by providing feedback on structure, content, and overall quality.
  - Collaborate with the student(s) to refine the manuscript for submission.
- **Publication Guidance:**
  - Provide guidance on selecting appropriate journals for submission.
  - Assist in preparing the manuscript for submission, addressing reviewer comments, and navigating the publication process.
- **Professional Development:**
  - Teach students discipline relevant research skills.
  - Encourage the student's professional development by providing opportunities for networking, attending conferences, and presenting research findings.