We thank the University of California, Irvine Undergraduate Research Journal for kindly allowing Auctus to adopt their journal submission guidelines to our needs.

The Journal welcomes the submission of manuscripts from all academic disciplines. It is expected that submissions to the Journal will be structured according to the established literary conventions of the discipline researched, and that manuscripts will be organized/sectioned in a manner that maximizes both the substance and clarity of the document. The Journal welcomes submissions of all kinds, including technical papers, research articles, creative scholarship etc., that are the result of original work completed by undergraduate students. Reviews will be accepted on a limited basis. Please see our guidelines for both Research and Creative submissions, below, and contact Auctus at urop@vcu.edu with any questions.

Manuscripts will be evaluated based on several categories. Take care to use proper grammar, and emphasize the structure and readability of the document, keeping in mind that the Journal is intended for a multidisciplinary audience. Manuscripts are further evaluated with respect to originality, academic and practical relevance, thoroughness, accuracy, consistency, credibility, and proper referencing.

Submission Instructions

1. Manuscripts must be typed, in 12-point Times New Roman font, double-spaced, 1-inch margins around, titled, numbered pages, and be accompanied by an abstract of 250 words or less. Papers can be at most 25 pages in length. Slightly longer papers will be considered if they can be shortened in editing or if they are the work of multiple undergraduate authors. Manuscripts should conform to a style that is considered the standard of the subject area. For example, scientific articles should follow the format of a professional journal related to the field of work. If possible, please include at least 2-3 images relevant to your submission that are positioned within the text. IMPORTANT: Do NOT indent paragraphs with tab or spacebar. Simply use enter to begin new paragraphs on the next line.

2. Electronically send the submission using one email with attachments to: http://go.vcu.edu/submitauctus
Paper Structure: Research Submissions

DISTRIBUTION AND STYLE

Because of the wide distribution of the Journal, authors of technical papers should clearly explain the context, applications, and/or origins of their work in the introduction. Authors should target their writing to the general VCU student audience. The article should be written in a manner that maximizes each article’s accessibility to all members of the VCU community. Concepts that are difficult for undergraduates to understand should be explained. For instance, a well-written submission might provide a definition for electron cryo-microscopy, but not necessarily a definition for an electron. We hope not only to increase awareness of research among various disciplines through our style of presentation, but also provide a forum where ideas can be exchanged and disseminated.

COPYRIGHT AND FORMAT

In most cases, publication in the Journal does not prevent subsequent publication of the work in other venues, since the Journal does not retain copyright of journal contents. However, some professional journals (for example, Science) do not accept papers that have appeared in another publication. Authors considering republication in another journal should check the submission policy for that journal. We suggest that submissions from a technical field should read like an article in a popular scientific publication (for example, Scientific American) rather than like a paper submitted to a professional journal. Writers should assume readers are interested in, yet unfamiliar with, their particular research topic and articles should not contain unexplained jargon.

If the student and mentor are working on confidential research or a project leading to a patent, publication in the Journal is recommended once the research is made public or a patent is obtained. It is the responsibility of the student and mentor to determine if another journal will accept a paper describing data that has been published in the Journal.

For research submissions, your paper must include a Title Page, an Abstract, Key Terms, Introduction, Acknowledgements, and Works Cited sections, in addition to the manuscript body. The following sections describe these parts of the paper.

**Title Page**
The title page must include the following:
- Student name(s)
- Paper title
- Professor(s) or mentor(s) who guided the research, and his/her/their home department(s)

**Abstract**
The abstract must include sufficient information for readers to judge the nature and significance of the topic, the adequacy of the investigative strategy, the nature of the results, and the conclusions. An abstract is not an introduction; it summarizes the substantive results of the work, not merely list topics that are discussed in the paper.
What Is an Abstract?
• An abstract is a summary of your paper and your whole project.
• It should have an introduction, body and conclusion.
• It highlights major points of the content and explains why your work is important, what your purpose was, how you went about the project, what you learned, and what you concluded.
• It is a well-developed paragraph with exact wording.
• It must be understandable to an interdisciplinary audience.
• It does not include any charts, tables, figures, spreadsheets, or other supporting information.

Abstract Format

Many abstracts follow a format similar to this:
1. The problem to be investigated.
   One to two sentences that state why the project was undertaken.

2. The purpose of the study.
   One to two sentences that outline the nature of the project and how it differs from other similar projects.

3. The methods.
   One to two sentences that summarize the important methods used to perform the project.

4. The major results.
   One to two sentences that summarize the major results—not necessarily all the results—of the project.

5. The interpretation.
   One to two sentences that summarize your interpretation of the results.

6. The implications.
   One sentence that summarizes the meaning of your interpretation—what is important about these results.

Abstract Guidelines

Abstracts should be:
• In Microsoft Word.
• In Times New Roman font, size 12.
• No more than 250 words in length.
• Single-spaced and a single paragraph.

Include the following in the abstract heading:
• Title of the paper.
• Full name(s) of the student author(s).
• Full name(s) of faculty mentor(s).
• Departmental Address
**Key Words**

This is a list of up to four words or short phrases that are central and specific to your research. All of the key terms must be explained in your paper. We will use these keywords to enable manuscript retrieval by topic search from the Journal.

**Introduction**

The Introduction provides the information needed to understand the rest of the paper and presents the project within context of the field. Make sure to:

- Establish the basis and background for the project.
- Define terms that may not be familiar to readers outside the field.
- Present the objective(s) and question(s) the research addresses.
- Summarize previous research and the current status of the topic.
- Discuss the relevance and significance of the research.
- Describe the general methods and rationale used to explore the hypothesis.

**Manuscript Body**

Organize the body of the paper carefully. Subdivide the body into sections to emphasize both content and clarity. Use headings and subheadings to make the organization clear. Consider the following:

- Use the accepted terminology of the field to describe any materials, subjects, or experimental procedures used to gather and analyze data.
- Include detailed methods, so readers would be able to replicate the investigation.
- State the results clearly and succinctly. Thoroughly discuss, interpret and analyze the implications of the findings.
- Describe any problems you encountered and explain any unexpected findings. Include ways to improve or expand your research.
- Provide a conclusion that restates the question(s), results, and broader significance of the research.
- Plainly and succinctly discuss the impact of the results, both globally and specifically, to enlighten readers, regardless of their previous background in the field of study.

The following sections describe sections that are common in many science papers. While these sections are common, they are not required.

**Methods and Materials**

The purpose of this section is to make it possible for someone versed in your area to repeat your experiment and reproduce your results. Describe, in complete detail, exactly what you did. Include the following (if applicable):

- Subjects used and their pre-experiment handling and care
- Sample preparation technique
- Origins of samples and materials
- Protocol for collecting data—how the procedures were performed
- Statistical analysis techniques used
- Information on computer programs used or written
- Descriptions of equipment setup and function
Results

Present the key results of the project without interpreting their meaning. Do not present raw data; use text, tables and figures to summarize. If feasible, follow the organization of the Methods and Materials section to provide consistency for the readers.

Discussion

Use this section to interpret the results of the project. Restate the major issues you discussed in the introduction and interpret them in light of the results. It is important to answer these questions:
• Did the results provide answers to the testable hypotheses?
• If so, what does this mean for those hypotheses; are they supported or refuted?
• If not, do the results suggest an alternate hypothesis? What is it? Why do the results suggest it?
• What further results might solidify the hypothesis? Have others proposed it before?
• Do these results agree with what others have shown? If so, do other authors suggest an alternate explanation to explain the results? If not, how does this experiment differ from others? Is there a design flaw in this experiment?
• How do these results fit in with results from other studies? Do results from related studies affect the way you have interpreted these results?

Beyond simply interpreting the results, consider the following (in any order):
• What factors or sources of error might have influenced your results?
• What anomalous data appeared and how can you explain them? Are they explained by a theory, either yours or somebody else’s?
• Was this experiment the most effective way to test your hypothesis? How could the experiment be improved to gain further insight?
• How have the results and conclusions of this study influenced our knowledge or understanding of the problem? How could this research be applied?
• What would be the next step in this study?
• What experiments could be run—or data found—to further support your hypothesis? What experiments could be run to disprove your hypothesis?

Acknowledgements

Thank the people/organizations that have supported the research and acknowledge funding sources where applicable.

Works Cited

Papers must contain full in-text referencing (not endnotes) with the complete references listed at the end of the paper. All resources—people, journals, pamphlets, etc.—must be referenced. References must be in MLA format. See the “Citing References” section on page 5 for an overview of the reference format. For further information, MLA handbooks are available in the library.
**Paper Structure: Creative Scholarship Submissions**

The VCU Journal of Undergraduate Research is a research journal, and research, at its heart, is a process of inquiry. Research identifies questions, issues or problems, defines methods to address them, gathers and analyzes data, and tries to reach meaningful conclusions. The best research is also a process of innovation; a creation of new procedures, knowledge, and ways to think about our world.

In addition to traditional research papers, the Journal also welcomes creative scholarship that is informed by the research process. To be considered for publication in the Journal, creative projects must also capture, in some way, the creative process sense of research, and clearly express the significance of that process.

Consider these examples:
- A research paper that breaks down and explains the techniques used in creative writing, with specific examples of artists and an analysis of their works. Possibilities include exploring the ways fiction writers increase the tension in a story, or how poets give their poems musical qualities.
- A nonfiction narrative/narrative journalism/literary journalism work that reports on specific people and/or events. These submissions should include—as a detailed author’s note at the end (or as a part of the narrative, if the author prefers)—a description of the research process, including the author’s goals, expectations, methods, results, and the significance of the work.
- Creative writing that discusses or otherwise deals with a field of research, such as a poem that explains, or a play that enacts, game theory. The accompanying abstract should describe the related field how the creative work relates to the field.
- A work that gives narrative expression to material that is or has been the subject of research. One example would be a narrative presentation of living conditions of Hispanic day laborers whose working conditions are the subject of research. Narratives of this type should be submitted as corollaries to the research they accompany or expand.
Submission Checklist

• My paper answers the question “What is the significance of my research?”.
• I have checked that my abstract and conclusions accurately reflect the content of my paper.
• I have explained any technical or scientific terms unique to the topic of my research.
• I have spell-checked and read my paper thoroughly.
• I have reviewed the Paper Submission Guidelines.
• If applicable, my paper includes in-text citations, graphs, and data, and is formatted according to the Paper Submission Guidelines.
• I have verified that the sources listed in the Works Cited section correspond to the in-text citations.
Layout and Style

This section describes the required format and layout for submissions.

Document File

Page Count
Papers are limited to a maximum of 25 pages.

File Format
Submitted documents must be in one of two file formats:
• PC-formatted Word (.doc) file
• Adobe Acrobat (.pdf) file
Please check with the Student Advisor for accepted formats of any supplementary files such as video or auditory files.

Page Margins
Set margins to one inch (1”) on all sides.

Font
Use 12-point Times New Roman throughout the paper.

Line Spacing
Set Line spacing to Double.

Page Numbers
Number all pages. Center page numbers on the bottom of each page.

Figures
Number and title all figures, including graphs, drawings and photos. Place figure captions below the figures.

Tables
Number and title all tables. Place table captions above the tables.

Equations
Number all equations. Place equation numbers in parentheses to the left of the equations.

Footnotes
In general, avoid the use of footnotes. If, however, there is critical supporting text that does not fit in the main text flow, a few footnotes may be appropriate.
Never use footnotes to cite references.
**Graphics**

Use graphics, including figures, tables, graphs, etc., to support your key findings. Graphics should be able to be understood on their own and must:

- Be of high resolution, at least 350 DPI (dots per inch). Note that many screenshots and pictures from the Web are 72 DPI, which is not suitable for print.
- Have neat, legible labels.
- Be simple. Avoid forcing too much information into a single graphic.
- Be clearly formatted.
- Indicate error. Include standard deviation information in tables and use error bars in graphs.
- Have detailed captions.
**Citing References**

All references should be in MLA format. This section gives an overview and examples of the reference format. For more details or other examples, please consult the MLA Handbook (available in the UROP Office) or search online for other MLA guides.

**In-Text Referencing**

In-text referencing depends on whether the reference deals with a specific section or the conclusions of an entire work.
- Specific section: Cite the name of the author(s) and page number(s) only (James 115). There is no comma before the page number.
- Entire work: Cite the name of the author(s) and year of publication (James, 1984). There is a comma before the year.

Format multiple-author references according to the number of authors:
- Two authors: (Collins and Fremont, 1977)
- Three authors: (Collins et al., 1988)

For parenthetical in-text references, “et al.” is not italicized. Italicize “et al.” everywhere else.

**Works Cited Section**

Here are some examples of common entries for a Works Cited section. If you cite two or more entries by the same author(s), provide the name(s) only in the first reference and use three hyphens and a period (---.) for the others. Also make sure to provide the unabbreviated article and journal titles.

**Books**

Author(s) of Book. Book Title. City Published: Name of Publisher, Year Published.

**Books Published in a Different Edition**

Author(s) of Book. Book Title. Ed. Name of Editor. Edition Number. City Published: Name of Publisher, Year Published.

**Scholarly Journal Articles Paginated by Issue**

Author(s) of Journal. “Article Title.” Journal Name Volume.Issue Number (Year Published): Page Numbers.

**Scholarly Journal Articles with Continuous Pagination**

Author(s) of Journal. “Article Title.” Journal Name Volume (Year Published): Page Numbers.

**Articles in a Collection or Anthology**  
Author(s) of Article. “Article Title.” Title of Collection or Anthology. Ed. Name of Editor. City Published: Name of Publisher, Year Published. Page Numbers.  

**Articles in a Newspaper**  
Author(s) of Article. “Article Title.” Name of Newspaper. Date, Edition: Page Numbers.  

**Articles in a Magazine (weekly/every two weeks)**  
Author(s) of Article. “Article Title.” Name of Magazine. Day Month Year: Page Numbers.  
Note: For a magazine published monthly or every two months, provide the month and year only.

**Interviews that You Conducted**  
Name(s) of Person(s) Interviewed. Interview Type. Date Conducted.  
Pei, I.M. Personal interview. 22 July 1993.  

**Electronic Publications**  
Because this area is so diverse, here are a few guidelines to follow. Be as complete and specific as you can.  
Title of database or project (underlined).  
Name of editor(s) of the database or project (if given).  
Electronic publication information, including version number, date of electronic publication (latest update), and name of the organization.  
Date of access and Website address.  

Note: To cite a selection within a database or project, begin with the author’s name and then, in quotes, the title of the work. Then proceed as described above. Be sure to give the specific Website address for the selection.
Tips on Good Writing

Producing a paper of excellent quality is not as daunting as it may seem; it just takes a little planning:

- Write your paper with an interdisciplinary audience in mind. Your audience includes students, faculty, and members of the university community who are not in your field. Consider their level of knowledge about your specialization as you write.
- Keep writing throughout the research process. By the time you come to the conclusion of your project, the amount of information you have collected can seem overwhelming. Try to sit down each week and write a few paragraphs about your topic. These preliminary drafts will be invaluable when you start to write your paper.
- Check sentence order. Make sure that all the sentences in a paragraph relate to each other. You may want to prepare an outline after you have written the paper to make sure that each paragraph is in the most appropriate place. If you sense that the paragraphs are out of order, try cutting the paper apart by paragraph and physically rearranging the segments. Then reorder them on your computer.
- Evaluate the use of quotations. Avoid excessive use of direct quotations; paraphrase whenever possible.
- Get feedback on a draft. Ask students in your field and from other disciplines to read your paper and make suggestions. Have your faculty mentor also read and make suggestions.
- Read to your plants. This may sound silly, but it works. A few days after you finish your paper, read it out loud. Reading aloud will force you to slow down, and you will find yourself catching spelling and grammar mistakes, as well as awkward phrasings or unnecessary sentences.

Style and Flow

Consider these suggestions as you write and update your paper.

- **Transitions and text flow:** Ensure that sentences and paragraphs flow cleanly from one to the next. Clean, logical transitions help prevent confusion. Consider whether extremely long paragraphs would be better broken up into two or more. You may want to prepare an outline after you have written the paper to make sure each paragraph is in the most appropriate place. If you sense that the paragraphs are out of order, try cutting the paper apart by paragraph and physically rearranging the segments. Then reorder them on your computer.
- **Precise language:** Be aware of overuse of inexact terms such as approximately and about. Unless there is a stated reason for avoiding precision, such terms frequently make it seem as if you are trying to avoid making solid, definite claims.
- **Statements of Fact:** All claims that are stated as facts must either be properly cited or logically follow from earlier statements. Subjective language like “obviously” and “it is imperative that” usually cannot be supported and should be removed.
- **Fact vs. interpretation:** There must be a clear distinction between stated facts (including previous work, methods and results) and your opinions and interpretations. A clear organizational structure can help with this, but sometimes it is important for both types of information to be within the same paragraph; make sure it is clear which is which.
- **First person:** While first person writing should generally be avoided, it is sometimes important to personalize your role or opinion. Make sure that first person references are appropriate and refer specifically to you (and co-researchers, if plural).
- **Passive voice:** Active voice writing is generally clearer and easier to read than the passive voice. However, science writing usually emphasizes what is being done over who is doing it, therefore falling naturally into passive voice. Use active voice if appropriate, but do not change the focus of the writing.
• **Tense:** It is usually best to avoid the future tense except for describing work to come. The research has already taken place (we did this, these results occurred), and the paper exists now (this paper shows, the next section describes). In comparative literature and similar papers, it is often appropriate to refer to a historical figure’s writing in the present tense (Homer writes, Galileo argues that).

• **Ending sentences with prepositions:** It is generally better not to end a sentence with a preposition. However, this should not be an absolute rule—do not rigidly follow it if clarity would suffer (keeping in mind Winston Churchill’s famous quote, “…ending a sentence with a preposition is something up with which I will not put.”).

• **Split infinitives:** Rigidly avoiding split infinitives is another common rule that should be broken if clarity would otherwise suffer. For example, use “to show clearly,” rather than “to clearly show.”

• **Beginning sentences with and:** It is not always incorrect to begin a sentence with and, but, however, or other connectors. Doing so can help emphasize an important point or reestablish a main idea after a long series of statements. However, they should be avoided if they do not clearly serve a deliberate purpose.

• **Meaningless phrases:** Avoid common phrases that add to the word count but have no meaning. Consider sentences beginning with such phrases as, “At this point it is important to remember that…,” which can almost always be removed without decreasing the meaning of the sentence or the paper. One meaningless phrase is used so often that it is listed next, as a separate entry.

• **…in order (to)…:** These two commonly-used words usually add nothing but length. They can almost always be removed, especially when they appear in the middle of a sentence. For example, change “We did this in order to achieve that” to “We did this to achieve that.”

• **Word Choice:** As you read through the text, consider whether you have used the best words to make your point. Often writers use words that do not quite mean what they intend, or use big words that sound impressive but detract from the paper’s readability. The following sections list some (but by no means all) commonly misused words to look for.