



NORTHWESTERN UNIVERSITY

MPO CAPSTONE PROJECT MANUAL

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Note that this manual is subject to change.

Questions about this manual should be directed to the Capstone Coordinator:

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INTRODUCTION TO THE CAPSTONE PROJECT

Catalog Description:

Each graduate is expected to complete a Capstone Project as a part of the research curriculum sequence. The Capstone Project is an intense, active learning project based on independent research of a question/problem the student negotiates with faculty input. Students should choose a topic in which they have some competence based on their academic work, professional experience, or exploration of future career options. It is a multi-faceted assignment that provides a vehicle for students to demonstrate their inquiry, analytical and writing skills and serves as a culminating academic and intellectual experience. This course section supports the continued development, implementation and completion of the student's Capstone Project requirement.

Note: The processes employed to complete the Capstone experience are as critical to the worthiness of the effort as is the final product.

Research Stream Objectives:

The purpose of the Research Stream is to:

- 1) Demonstrate the ability to perform, at an autonomous level, literature reviews as an effective component of evidence-based-practice. A.2.11, C.1.11, C.3.1
- 2) Develop viable literature searches in support of research-based activities. C.1.22
- 3) Participate in clinical research project by completing a Capstone Project. A.2.10, C.7.6

All of the above objectives apply to the [NCOPE Core Curriculum for Orthotists and Prosthetists Standards and Guidelines for the Accreditation of Educational Programs in Orthotics and Prosthetics, 2010 Edition](#):

“Section D RESEARCH

The graduate must demonstrate the ability to perform, at an autonomous level, literature reviews as an effective component of evidence-based-practice and to participate with clinical research projects. The graduate must be able to develop viable literature searches in support of research-based activities. Each graduate is expected to complete a “capstone project/experience” as a part of the curriculum sequence.”

Required Text:

None.

CAPSTONE REQUIREMENTS

Planning for Completion of the Capstone Project:

Students should begin thinking about the Capstone Project during Research II in Session 4. Research II provides the entry-level clinician with the knowledge and skills necessary to conduct critical evaluation of published research and to identify the clinical implications for patient care.

Topics covered include:

- Defining research questions
- Managing bibliographic information
- Technical writing
- Literature reviews in different contexts

During Research II, students will begin preparation for the Capstone Project. While students only “enroll” in the Capstone Project for one session (Research III in Session 7), the project should be a work in progress leading up to completion of Research III. See Appendix A for session overview.

The table below provides a synopsis of the Capstone Project process. Additional details about each deliverable are provided in the following sections.

Course	Capstone Deliverable	Due Date*
Research II	Select research topic/question and faculty mentor	Mid Session 4
	Submit Capstone Project Agreement Form	Week 8 Session 4
	Present research question to students and faculty	End Session 4
Special Topics I	Proposal outline to faculty mentor	Mid Session 5
	Present research proposal to students and faculty	End Session 5
	Submit written research proposal	End Session 5
Special Topics II	Present progress update to students and faculty	Mid Session 6
Research III	Final presentation to students and faculty	TBD
	Submit written research report	End Session 7
	Peer assessment	End Session 7
	Self-assessment	End Session 7

*Specific dates will be provided in due course.
TBD – to be determined

Acceptable Capstone Projects:

Acceptable Capstone Projects must involve a clinical research project which is defined as any clinically relevant investigation that involves a systematic process of gathering information and evaluating/assessing the information to answer the research question.

Examples:

- Mechanical characterization/analysis of components and/or devices. A systematic process must be used to characterize/analyze a component or device.

- A systematic review of the literature on a clinically relevant topic. The review needs to involve a systematic process of gathering and evaluating/assessing the information on the defined topic.
- Developing a clinical algorithm for an area of practice. A proposed algorithm must be evidence based to the fullest extent possible. A systematic process must be used to develop the algorithm and evaluate/assess it.
- Development of a new device or component or improvement of the design of an existing device/component. The development process must be systematic, well documented and the developed component evaluated in some way.
- Using/developing analytical tools/models/simulations to explore a problem. A systematic process must be used to develop the tool/model/simulation and/or evaluate/assess it.

The following examples will likely have Institutional Review Board requirements:

- Exploring an issue important to the management of a clinical facility (e.g. using a survey to identify the most common outcome measures currently used in P&O clinical practice as a first step in implementing outcome measures in a clinical facility; putting together a business plan).
- Analysis of an existing data set to answer a new research question (e.g. a clinical facility may have an existing set of de-identified satisfaction data that you can access and query; a research lab may have an existing set of de-identified data that you can access and query).
- Prospective collection of human subject data. This type of project will only be approved by the Capstone Coordinator in circumstances where it is deemed feasible and resources are available to support the project.

NOTE: Any research involving human subjects requires approval by the [Northwestern University Institutional Review Board \(IRB\)](#). Note that this process is typically time consuming and therefore unlikely to fit within the scope of the Capstone Project very often. Contact the Capstone Coordinator for information.

Research II - Select Research Topic/Question and Faculty Mentor:

- Selection of topic and assignment of faculty mentor takes place onsite during first five weeks of Session 4 as part of Research II.
- Faculty mentors and the Capstone Coordinator will be available by appointment during the first 5 weeks of Research II to discuss Capstone Project research topics with students.
- Assignment of faculty mentor must be negotiated with individual faculty and approved by the Capstone Coordinator by end of Week 6 of Session 4.
- In preparing their research questions, students should consider what the project will entail and how it will be implemented (e.g. how the work will be structured; what resources might be needed to complete the work; the time frame needed for different phases of the project; etc.)
- Students and faculty mentors must complete the Capstone Project Agreement Form (Appendix B) by the end of Week 8 of Session 4 and submit to the Capstone Coordinator. The mentoring plan component of the Agreement Form may be amended as needed and by agreement between the faculty mentor and student.

- Students should consult with assigned faculty mentors while preparing their research question to present to the class in Week 12 of Session 4.
- Using PowerPoint, the student's presentation to the class should be 5 minutes long and clearly convey the research question and motivation for the research question. There will be 3 minutes for questions at the end of the presentation.
- PowerPoint slides must be posted to Blackboard by midnight the night before the presentation is scheduled to occur.
- Presentations will be made to an audience consisting of students and faculty.

Capstone Project Faculty Mentors:

At the commencement of Research II, students will be provided with a list of potential faculty mentors and their areas of expertise and research interest. During the first five weeks of Research II, students are encouraged to discuss research interests and topics with faculty mentors. Students are encouraged to focus these conversations where there is common interest between them and a faculty mentor and/or with faculty with whom they might like to work more. Using these discussions as a framework, faculty mentors will meet with the Capstone Coordinator in Week 6 to formally assign each student to a faculty mentor. While the faculty will do the best they can to try to be responsive to the research interests of students, the process of assigning faculty mentors and ultimately approving research projects requires balancing many factors in order to ensure that each student has the fullest chance of successfully completing a Capstone Project. These factors include but are not limited to the expertise available among faculty mentors, the student's academic history, the resources available to conduct projects, the feasibility of project scope, etc.

Special Topics I - Written Research Proposal and Presentation:

- Work on the research proposal and presentation takes place onsite during Session 5 as part of Special Topics I.
- Based on your approved research topic/question, students will prepare both an oral and written Capstone Project proposal.
- Students should consult with assigned faculty mentors throughout preparation of their research proposal.

Proposal outline:

- The proposal outline is due mid Session 5.
- The outline of your research proposal should clearly show the format you plan to use for your proposal based on both the information in Appendix C as well as the lecture Dr Gard gave you on writing a research proposal.
- The outline of your proposal should also, at a minimum, provide bulleted notes as to the project specific content you plan to discuss in each section of the proposal.
- The outline should be submitted by email directly to your faculty mentor as a Word document so that the mentor can provide feedback using comments and track changes. A copy also needs to be uploaded to Blackboard.

Oral proposal presentation:

- Using PowerPoint, the presentation to the class should be no more than 10 minutes long and clearly convey the proposed research plan. There will be 3 minutes for questions at the end of your presentation.
- PowerPoint slides must be posted to Blackboard by midnight the night before the presentation is scheduled to occur.
- Presentations will be made to an audience consisting of students and faculty.
- Students will have 1 week between the proposal presentation and submission of the written proposal to incorporate feedback from your faculty mentor and the presentation session.

Written proposal:

- Research proposals should contain a literature review sufficient to provide persuasive evidence that there is a need for the research project being proposed. In addition to providing a rationale for the proposed research, the proposal should describe methodology for conducting the research and a statement on anticipated outcomes and/or benefits to be derived from the study.
- The written proposal, due at the end of Session 5, should be no more than 12 pages. All papers must be typed double-spaced on 8.5" x 11" paper with 1 inch margins using Arial or Times New Roman 12-pt font. Use of figures and tables, if necessary, are not included in the page count. See Appendix C for additional instructions.

Special Topics II - Present Research Progress Update:

- Each project will evolve differently over time depending on the particular research topic/question selected. While students only “enroll” in the Capstone Project for one session (Research III in Session 7), the project should be a work in progress leading up to enrollment in and completion of Research III.
- Presenting your research progress update provides an opportunity for you to formally reflect on your progress to date and receive feedback on issues that may have arisen.
- Using PowerPoint, the presentation to the class should be no more than 10 minutes long and clearly convey any progress made to date on the Capstone Project. There will be 3 minutes for questions at the end of your presentation.
- PowerPoint slides must be posted to Blackboard by midnight the night before the presentation is scheduled to occur.
- Presentations will be made to an audience consisting of students and faculty.

Research III - Final Research Report and Presentation:

- The research project and written report should be completed by the end of Session 7/Research III.
- Students are required to submit bi-weekly written updates and attend periodic review sessions with their faculty mentor throughout Session 7.

Oral final presentation:

- To be determined. Given that students are off-site, we are exploring the logistics regarding a final presentations.

Written final report

- The final research report represents the culmination of the student's Capstone Project. The report should elaborate on what was discussed in the proposal, present results, and a thorough discussion/conclusion.
- The written report, due in the 2nd last week of Session 7, should emulate the format of a journal article similar to those submitted to the [Journal of Prosthetics and Orthotics](#) unless a different format better suited to your particular research project is approved by your faculty mentor.

Peer and self assessments

- During the final week of Session 7, students will be assigned another student's final research report to read and grade along with submitting a self-assessment of their own research report.

CAPSTONE PROJECT ROLES AND RESPONSIBILITIES

Capstone Coordinator Responsibilities:

The Capstone Coordinator is responsible for assisting students in navigating the Capstone Project process. The Capstone Coordinator will:

- Work with you to identify a faculty mentor.
- Approve your research topic/question to ensure that it is of sufficient and feasible scope to satisfy the Capstone Project requirements.
- Be available, by appointment, to consult with you and/or your faculty mentor during the entire process.
- Oversee and coordinate grading of the Capstone Project and related activities.

In approving your research topic/question and faculty mentor assignment, the Capstone Coordinator must consider if:

- The project scope is feasible.
- NUPOC has the resources available to support the project, including a faculty mentor with relevant expertise in the topic area.
- There are IRB requirements and whether they can be addressed successfully in the given time frame.

Faculty Mentor Responsibilities:

The faculty mentor is responsible for assisting students in completing the Capstone Project. The faculty mentor will:

- Help their assigned students identify a research topic/question.
- Be available, by appointment, to consult with the student regularly during the entire Capstone process.
- Provide individualized feedback.
- Provide open dialogue throughout the project.
- Provide input on both the project design and the quality of drafts of the written proposal and final report.
- Participate in and coordinate grading of the Capstone Project and related activities.
- Forward the student's final grade to the Capstone Coordinator.
- Consult with the Capstone Coordinator during the entire process.

Student Responsibilities:

During the Capstone Process, students should:

- Think critically, solve challenging problems, and develop skills such as oral communication, planning, self-sufficiency, and goal-setting.
- Demonstrate facility with methods of inquiry (i.e., the ability to ask the right questions, to synthesize ideas, to identify and use evidence, to draw and support conclusions, to recognize compelling research, to communicate your ideas, and/or to solve a problem using a specific set of tools).
- Reach a deep understanding of a clearly defined and focused topic.

- Work primarily alone (i.e., independently).
- Identify a faculty mentor.
- Give written updates and attend periodic face-to-face review sessions with the faculty mentor.
- Expend significant effort in planning and implementation of the project.
- Prepare and submit written work on time.
- Present work to an audience of students and faculty as required.

Tips for Students Pursuing Research Projects:¹

- Faculty mentors are busy people juggling multiple student, teaching and research demands. Your Capstone Project is important but not their only priority. They will therefore assume that you are an independent learner who will take responsibility for the mentoring relationship.
- While ad hoc meetings may occur, don't rely on that as your only way to get feedback and advice on your Capstone Project. Schedule regular meetings with your faculty mentor but be aware that meeting frequency may change over the duration of the project. You should plan to meet with your faculty mentor a minimum of twice per session, although additional meetings may be required as determined by agreement between the student and mentor. Meetings should be scheduled at a mutually amenable time.
- Note that meetings with your faculty mentor may occasionally occur as a group with the other students that the faculty mentor is assigned. Group meetings are highly likely where there may be overlap in project areas between students.
- Be respectful of each other's time. That means that if you can't make it to a scheduled meeting, try to give as much advance notice as possible and re-schedule as soon as possible.
- Take control of meetings. Having a meeting isn't enough to ensure that they are helpful and productive. It is easy to get distracted. Have a simple agenda that covers what you've done since the last meeting; questions that may have arisen; feedback you'd like; what you plan to do before the next meeting; be clear about what you are supposed to do next; schedule the next meeting.
- Consider sending your faculty mentor an email agenda before a meeting and a summary of the discussion after a meeting. The summary shouldn't record every word said but rather the main outcomes in dot points. Appendix D provides a sample meeting agenda that also serves to track outcomes.
- Be sure to create agreed upon deadlines for project related tasks so that your faculty mentor can provide you with timely feedback on drafts of written work and presentations as needed.

¹ Kearns H & Gardiner M (2012) The Seven Secrets of Highly Successful Research Students. Thinkwell Publications: Australia.

CAPSTONE GRADING PROCEDURES

A Capstone Project must demonstrate the following characteristics although it is possible for each characteristic to be satisfied in different ways depending on the particular research project undertaken:

- **Originality:** You must reach your own deep understanding of a clearly defined and focused research topic. You must formulate your own perspective on an issue and draw your own conclusions.
- **Independence:** Although you will have a faculty mentor to guide you, the work you undertake must be primarily your own.
- **Appropriate Scope:** Your research topic/question should challenge you but remember that you have only a limited amount of time to complete your research and report, therefore you must keep your project within a limited and realistic scope.
- **Orderly and Objective Process of Inquiry:** While undertaking your Capstone Project, you must demonstrate facility with methods of inquiry, including asking the right questions, synthesizing your ideas, identifying and using evidence to draw and support conclusions, recognizing compelling research, communicating your ideas clearly, and/or solving a problem using a specific set of tools.

Note: Acceptable Capstone Projects must involve a clinical research project which is defined as any clinically relevant investigation that involves a systematic process of gathering information and evaluating/assessing the information to answer the research question.

Breakdown of Capstone Project Grading:

30% - Interaction with faculty mentor

- “Was the student engaged with the process and responsible for the project?” (5%)
- “Did the student display independence/self-sufficiency during the project?” (5%)
- “Did the student display creativity with the project?” (10%)
- On time completion of all interim deliverables (10%)

10% - Oral Presentations

60% - Research Report

- Self-grading (5%)
- Peer grading (5%)
- Faculty mentor (25%)
- 2nd reader (25%) (another faculty member or the Capstone Coordinator)

Note: Students must meet Capstone Project requirements as outlined in this document and/or otherwise assigned by their faculty mentor. The faculty mentor coordinates grading using the Grading Rubric (Appendix E) and forwards a final grade to the Capstone Coordinator.

Grading Scale	GPA	
A	90.000-100.000	4.0
B	80.000-89.999	3.0
C	70.000-79.999	2.0
D	60.000-69.999	1.0
F	59.999 and Below	0.0

Note: This grading scale was approved by the NUPOC faculty in November 2013 and applies to all courses at NUPOC. Please contact the program director at john-michael@northwestern.edu with any questions regarding this policy.

**Appendix A
OVERVIEW OF MPO SESSIONS AND COURSES**

CURRICULAR ELEMENTS	Session 1	Session 2	Session 3	Session 4	Session 5	Session 6	Session 7
	Year One				Year Two		
Science: Foundational & Applied	Clinical Sciences	Behavioral Sciences I					
	Materials Science	Techniques in O/P Practice					
	Human Movement Science I	Human Movement Science II	Human Movement Science III				
Clinical: Principles & Practice		Supervised Clinical Experience	Supervised Clinical Experience	Supervised Clinical Experience	Supervised Clinical Experience	Supervised Clinical Experience	Supervised Clinical Experience
	Principles of O/P Practice		Assessment in O/P	Prosthetic Practice I: Upper Limb	Prosthetic Practice III: Distal to Knee	Prosthetic Practice III: Proximal to Knee	Special Topics III
			Orthotic Practice I: Head/Spine/ Trunk	Orthotic Practice II: Upper Limb	Orthotic Practice IV: Distal to the Knee	Orthotic IV: Proximal to Knee	Practice Management
Health & Society	Professional Issues I		Behavioral Sciences II		Professional Issues II	Professional Issues III	
Professional Development		Research I		Research II	Special Topics I	Special Topics II	Research III

Appendix B
CAPSTONE PROJECT AGREEMENT FORM

Student Name _____ **Date** _____

Faculty Mentor _____

Research Topic/Question: _____

Mentoring Plan (provide details of agreed upon mentoring arrangements including when you will meet with your mentor; how you will document meetings; due dates for drafts and other tasks; etc.): _____

My project requires the following (provide information as to what resources you anticipate your project may require):

- | | | | |
|--------------------------------|--------------------------|---------------------------------------|--------------------------|
| IRB approval | <input type="checkbox"/> | Deidentified data from NUPOC | <input type="checkbox"/> |
| Use of the motion analysis lab | <input type="checkbox"/> | Deidentified data from other facility | <input type="checkbox"/> |
| Use of the MTS machine | <input type="checkbox"/> | Use of the Stratasys System | <input type="checkbox"/> |
| Access to computer resources | <input type="checkbox"/> | Materials/Components _____ | <input type="checkbox"/> |
| _____ | <input type="checkbox"/> | _____ | <input type="checkbox"/> |

I have discussed the expectations of this Capstone Project with the student and give my approval for this project.

Faculty Mentor Signature _____ **Date** _____

I give my approval for this Capstone Project.

Capstone Coordinator Signature _____ **Date** _____

I agree to fulfill the requirements for this Capstone Project.

Student Signature _____ **Date** _____

Appendix C

Format of the Research Proposal

The purpose of this assignment is to give you the opportunity to document what you have learned about your research topic, and to put together your own research plan for addressing a relevant issue in the field of prosthetics and orthotics. You should be able to use this proposal as a component of your final Capstone Project written report.

The research proposal should be written in the following form, using the headings indicated below. Sections 3-5 should not exceed ten double-spaced pages. Figures and tables are very useful and do not count towards the page allocation. The paper is short, but needs to be extremely well written. We expect your final reports to be professional. Neatness and good organization count! Use your spell checker. It would be of tremendous benefit to you to have a colleague or two proofread your final document for errors before you turn it in to your faculty mentor.

1. TITLE PAGE

Should include the title of your paper, your name, and the date.

2. ABSTRACT (max 250 words)

This is the most important section of any report. The abstract should state the primary objectives of your research proposal, give your purpose statement, indicate the significance of your proposed research plan, briefly describe the protocol, and provide the expected results of your study with some indication of clinical implications. Do not simply say “This paper will cover...”, but instead summarize the main points of the paper.

3. INTRODUCTION & BACKGROUND (~1-2 pages)

Briefly describe what you will be presenting and why it is important. Relate concisely the anatomical and/or clinical framework of your topic. State the purpose of your proposed work clearly and concisely—“The purpose of this project is to...”.

4. PREVIOUS INVESTIGATIONS (~4-6 pages)

Present a review of previous research on this topic. Do not simply list in expanded form a number of references, but try to assimilate what has been done and tell why it is relevant to your work. This section should be in a form such that the current “state-of-the-art” is easily appreciated. State the shortcomings in our current knowledge. Suggest areas that require further research. This can act as the motivation/rationale for your proposed project.

5. PROPOSED RESEARCH (~2-4 pages)

From areas suggested at the end of the previous section, state concisely and specifically a particular research problem/question that you propose to address. State your hypothesis/hypotheses if appropriate. In broad terms, describe how you might investigate this problem through the design and implementation of a systematic inquiry and experiment if appropriate. Indicate your anticipated results. Your research question (and hypotheses), information gathering/data collection and expected results should be linked. Point out the difficulties that you may expect to encounter in this research. State what you believe will be the

significance of your proposed research. Finally, provide a realistic timetable for the completion of the work.

6. REFERENCES

References and reference citations should conform to the style of the Journal of Prosthetics and Orthotics (<http://edmgr.ovid.com/j-p-o/accounts/ifaauth.htm>).

Electronic Submission

Please email your document as an attachment to your faculty mentor and cc the Capstone Coordinator (s-fatone@northwestern.edu).

Appendix D²

Sample Meeting Agenda

Since Last Meeting		Outcomes
1	Things I was going to do: * * *	
2	Things the supervisor was going to do: * *	
3	Other developments since last meeting: * *	
4	Show and tell: Drafts, results, hypotheses	
5	Feedback from supervisor * *	
6	Questions, issues that need clarification * *	
The Next Steps		When
7	Things I will do: * *	
8	Things the supervisor will do: * *	
9	Are we on track? What is the next milestone?	
10	Date of next meeting	
11	FINALLY, THE NEXT MOST IMPORTANT THING IS:	

² Kearns H & Gardiner M (2012) The Seven Secrets of Highly Successful Research Students. Thinkwell Publications: Australia.

**Appendix E
Grading Rubric**

	Excellent (A)	Very Good (B)	Good (C)	Fair (D)
Interaction with Faculty Mentor (30%)				
Engagement/ Responsibility (5%)	The student was <u>highly</u> engaged with the entire process. They took <u>full</u> responsibility for the project.	The student was <u>reasonably</u> engaged with the entire process. They took <u>reasonable</u> responsibility for the project.	The student required <u>ongoing encouragement</u> to remain engaged with and responsible for the process.	The student demonstrated <u>little</u> engagement with the process and took <u>little</u> responsibility for the project.
Independence/ Self-sufficiency (5%)	The student displayed independence in <u>all</u> aspects of the development, implementation and evaluation of the project. The student was almost entirely <u>self-sufficient</u> .	The student displayed independence in <u>some</u> aspects of the development, implementation and evaluation of the project.	The student required <u>ongoing encouragement</u> to work independently in the development, implementation and evaluation of the project.	The student was <u>unable</u> to work independently in the development, implementation and evaluation of the project.
Creativity (10%)	The student displayed creativity by <u>exceeding</u> or going outside of conventional approaches in either project content <u>and</u> methodology.	The student displayed creativity by going outside of conventional approaches in either project content <u>or</u> methodology.	The student required <u>ongoing encouragement</u> to be creative in either project content or methodology.	The student <u>did not</u> display creativity in either project content or methodology.
Completion of interim deliverables (10%)	<u>All</u> deliverables were completed on time.	<u>All but one</u> of the deliverables were completed on time.	Only <u>some</u> of the deliverables were completed on time.	<u>None</u> of the deliverables were completed on time.

	Excellent (A)	Very Good (B)	Good (C)	Fair (D)
Oral Presentations (10%)				
Quality of Oral Presentations	The presentations were <u>clear and concise</u> , the presenter was <u>comfortable and professional</u> , and presentation materials were <u>appropriate and beneficial</u> to the overall presentation.	The presentations were <u>reasonably clear and concise</u> , the presenter was <u>comfortable and professional</u> , and presentation materials were <u>appropriate</u> .	The presentations were <u>somewhat clear</u> , the presenter was <u>professional</u> , and presentation materials were <u>appropriate</u> .	The presentations were <u>unclear</u> , the presenter <u>lacked professionalism</u> , and presentation materials were <u>inadequate</u> .
Research Report (60%)				
Clinical Relevance (10%)	The report presents clinically relevant research. The study is directly (immediately) applicable to clinical, theoretical, or educational problems.	The report presents clinically relevant research which applies new methods to earlier problems or enhanced solutions to clinical problems. The study can indirectly (in time) contribute to the resolution of clinical, theoretical or educational problems.	The report presents a worthwhile replication of earlier research. The study is inspired by clinical, theoretical or educational problems, but the outcomes have only limited clinical relevance.	The report presents a topic, research question or clinical problem that is already very well covered in the literature. The study has little relevance for clinical, theoretical or educational problems in prosthetics and orthotics.
Knowledge of the literature/research related to the project (15%)	<u>Excellent</u> evidence of knowledge of the literature or research related to capstone project.	<u>Clear</u> evidence of knowledge of the literature or research related to capstone project.	<u>Adequate</u> evidence of knowledge of the literature or research related to capstone project.	<u>Inadequate</u> evidence of knowledge of the literature or research related to capstone project.
Method/ Approach (15%)	The method is <u>appropriate</u> and described in <u>sufficient detail</u> .	The method is <u>appropriate</u> and described in <u>reasonable detail</u> .	The method is only <u>partially</u> described or more appropriate methods should have been considered.	The method is <u>poorly</u> described and more appropriate methods should have been considered.

	Excellent (A)	Very Good (B)	Good (C)	Fair (D)
Synthesis of Ideas (10%)	Demonstrated <u>critical reflection</u> that was <u>analytic and interpretive</u> rather than descriptive. The conclusions are <u>supported</u> by the results. <u>Careful consideration</u> has been given to alternative interpretations and limitations.	Some attempt at <u>critical reflection</u> and synthesis of ideas. The conclusions are <u>supported</u> by the results. <u>Some consideration</u> given to alternate interpretations and limitations.	Reflections are mainly descriptive. The conclusions are <u>reasonable</u> , but greater consideration of alternate interpretations or limitations of the study are warranted.	<u>Inadequate</u> evidence of analytic or interpretive reflections. Conclusions are <u>unclear or unsupported</u> or represent a <u>biased</u> interpretation of the results.
Quality of writing (10%)	Expression is <u>excellent</u> ; grammar and spelling are <u>correct</u> . Uses <u>appropriate and accurate</u> citation methods.	Expression is <u>very good</u> ; grammar and spelling are <u>correct</u> . Uses <u>appropriate</u> citation methods.	Expression is <u>good</u> ; grammar and spelling errors are <u>infrequent</u> . Citation methods are <u>inconsistent</u> .	Expression is <u>fair</u> ; grammar and spelling errors are <u>common</u> . Citation methods are <u>incorrect</u> .

