UNIVERSITY OF ARKANSAS

College of Engineering
Department of Biomedical Engineering

STUDENT: _____ DATE OF EXAM: _____

MATRICULATION SEMESTER/YEAR: _____

PROGRAM: **Ph.D.**

MILESTONE: DISSERTATION DEFENSE

CRITERION	EXCEPTIONAL		SATISFACTORY		REMEDIAL
1. <u>Applies</u> a breadth & depth of advanced <u>biological and engineering knowledge</u> at the graduate level towards solving BMEG problems	• Consistently provides detailed answers on bio-mechanisms and engineering approaches without prompting • Able to explain the biological and engineering aspects of the problem with deep insight • Able to explain the biological system at the functional/structural/factual level • Demonstrated the ability to gain insight into a biological problem using engineering principles • Able to use new material to solve a problem on his/her feet		• Provides details but with some prompting • Demonstrates biological and engineering insight, but needs prompting to demonstrate deep insight • Able to explain the biological system and engineering principles at the structural/factual level; needs prompting to utilize engineering principles to solve a biological problem • Requires some prompting to integrate new material to solve a problem		• Fails to articulate simple concepts in cell/tissue or physiology • Unable to explain how bio events inform design • Unable to explain a biological system at its functional level • Knows biological facts but can't apply at engineering/quantitative level • Unable to solve basic engineering problems • Unable to deal with or incorporate new information
	❑ 5 - Exceptional	❑ 4 – Very Good	❑ 3 - Satisfactory	❑ 2 – Needs improvement	❑ 1 - Remedial
2. Demonstrates ability to read, analyze and synthesize <u>literature</u> to state research problem **Demonstrates <u>value of their research</u> in addressing gaps in field**	• Able to analyze the literature with a critical eye • Formulates a concise and clear research problem • Efficiently places his/her work in larger contexts, typically integrates knowledge from multiple sources toward his/her own approach & the field at large		• Often analyzes research critically • Explains research problem with some prompting • Shows some ability to place work in a larger context; occasionally able to integrate knowledge from other sources toward own work or field at large		• Demonstrates general trust in all published literature • Unable to form a clear research problem • Unable to place body of work into the big picture; difficulty integrating knowledge from multiple sources toward his/her own work or the field at large
	❑ 5 - Exceptional	❑ 4 – Very Good	❑ 3 - Satisfactory	❑ 2 – Needs improvement	❑ 1 - Remedial
3. Sound <u>hypotheses/ experimental approaches</u>	• Able to develop and explain an experimental design • Able to clearly articulate rationale in defense of a claim without prompting		• Offers a design but unable to clearly explain it, some information irrelevant • Demonstrates understanding of rationale		• Unable to formulate a hypothesis/design an experiment • Cannot detect his/her study's limitations and errors

<u>Data</u> addresses research questions **Significant original contribution** **Outlines <u>limitations</u> and <u>future recommendations</u>**	• Experimental approaches are rationally designed; data addresses hypotheses • Contributes new knowledge to field • Identifies errors & limitations and formulate future possible future recommendations • Able to interpret results objectively, consistently differentiates objective interpretation from conjecture & speculation		but needs prompting to apply it to the problem • Contributes new knowledge to field • Needs some assistance in making objective interpretations of data; occasionally recognizes conjecture and speculation		• Makes vague statements regarding analysis approaches with no clear tie to question • Unable to defend statements
	❑ 5 - Exceptional	❑ 4 – Very Good	❑ 3 - Satisfactory	❑ 2 – Needs improvement	❑ 1 - Remedial
4. Has a keen understanding of ethical and professional responsibility	• Able to clearly articulate potential ethical issues relating to research		• Requires prompting to identify ethical issues relating to research		• Unable to articulate concepts of ethics and responsibility as it relates to research
	❑ 5 - Exceptional	❑ 4 – Very Good	❑ 3 - Satisfactory	❑ 2 – Needs improvement	❑ 1 - Remedial
5. Effectively and efficiently <u>communicates</u> to both expert and lay audiences	• Develops a chain of logic that is transparent & easy to follow • Offers only relevant, targeted information • Engages committee in the clarification process • Able to restate question in own words • Easily uses technical terminology and concepts to make points		• Offers a chain of logic but it is not particularly transparent or easy to follow • Offers mostly targeted, relevant information • Is aware of technical terminology but has difficulty connecting it to explanations		• Rambles and sidesteps the question • Unable to make list of clear goals and questions • Responds to different question than asked
	❑ 5 - Exceptional	❑ 4 – Very Good	❑ 3 - Satisfactory	❑ 2 – Needs improvement	❑ 1 - Remedial
Comments and recommendations for future actions	* A minimum score of ≥3 in all categories required for pass * A score of 1 in any category is an automatic fail				
Final Outcome	❑ Pass		❑ Pass (with contingency) * see recommendations for future actions		❑ Fail

Advisory/Dissertation Committee

Type or print name (Chair)	*Signature (Chair)*	*Date*
Type or print name	*Signature*	*Date*
Type or print name	*Signature*	*Date*
Type or print name	*Signature*	*Date*

Graduate Coordinator/Department Head

Type or print name	*Signature*	*Date*