Graduate level performance with respect to **Theory** includes (but may not be limited to) the ability to:

1. Recognize the most prominent epistemological frameworks (e.g., cognitive theory, social psychology, semiotic theory, actor-network theory) that inform research in Human Centered Design & Engineering (HCDE).
2. Understand the intellectual implications of those different frameworks for the processes and results of scholarly inquiry in HCDE.
3. Explain how theory motivates and supports the practices of knowledge-making.
4. Apply theory appropriately and productively to the framing or analysis of research issues in HCDE.

Graduate level performance with respect to **Research Methods** includes (but may not be
limited to) the ability to:

1. Understand the many different research paradigms (e.g. experiments, ethnography, survey, qualitative, quantitative) that guide inquiry in our field.
2. Articulate and identify appropriate criteria, particularly strengths and limitations, of different methodologies.
3. Formulate a question that is important in terms of practice and in terms of extending or critiquing theory.
4. Formulate a research design that is manageable and executable.
5. Articulate the practical and theoretical contributions that different methods can play in design research.

Graduate level performance with respect to **Design & Engineering** includes (but may not be limited to) the ability to:

1. Comprehend the procedures and processes through which interactive products are designed and evaluated using a human-centered approach, including:
    - User research methods
    - Prototyping techniques
    - Evaluation methods
    - Collaboration within workgroups and design teams (broadly defined)
    - Sociotechnical processes within an organization and across organizations
2. Understand and apply the principles such as interaction design, information visualization, information design, and user-centered design across a broad range of formats and for a broad range of users. Students will use these principles to both design successful interactive artifacts and insightfully discuss design issues.

3. Understand the principles, processes, and methods associated with design thinking, including:
    - Definition of design questions and associated research questions.
    - Planning and conducting user research to investigate a design problem further
    - Analyzing and synthesizing data from user research to generate ideas
    - Techniques for ideation and developing new ideas, using techniques such as sketching, brainstorming, and idea critiques
    - Combine empathy, creativity, and rationality to in the context of new design ideas

Graduate level performance with respect to **Society and Systems** includes (but may not be
limited to) the ability to understand:

1. The roles, responsibilities, and impacts of technologies
2. How technology interacts with social organizations and institutional practices
3. The cultural role of information and communication technologies (ICT), including the ability to identify the impacts of technologies on diverse communities
4. The ethical and societal implications of ICTs in all forms
5. A systems perspective and the higher-order design issues and the social and cultural implications associated with systems thinking