

RICE UNIVERSITY

**Master of Human-Computer Interaction  
and Human Factors (HCI&HF)**

**Proposal**

**Department of Psychology**  
February 19, 2018

## **Executive Summary**

The proposed new professional Master's degree program will offer students graduate-level training in an applied area of Psychology for which there is substantial demand for Master's-level training. This will be a 2 year, 38-credit full-time program focussed on Human-Computer Interaction and Human Factors (HCI&HF, CIP code 30.3101; STEM-eligible) within the Department of Psychology. This is intended to be a small program admitting approximately 4–5 new students per year with fall entry only. The proposed degree program would provide students with a deep set of methodological skills along with scientific and practical knowledge in a high-demand field.

### **1. Rationale**

Psychology, like many other academic disciplines, spans a wide range of subfields, some of which are more oriented toward basic research and some of which are more applied. At present, there are several applied areas of Psychology in which there is demand from industry and government for people with Master's-level training. Rice's Psychology department covers some of these areas but does not offer a Master's-level program to meet the existing demand, which represents a missed opportunity.

An example area is Human-Computer Interaction (HCI) and Human Factors (HF). Human Factors is the scientific consideration of people in the design of products, services and systems. Human Factors is responsible for ensuring that systems meet the needs and expectations of the user, and more importantly, conform to the capabilities and limitations of those users. Human Factors can increase the ability of users to effectively use complex systems and enhance the safety of those systems. Human Factors focuses much of its efforts to the study of complex human-machine interfaces such as automobile controls, aircraft cockpits, medical devices, and many others. HCI is the subarea within human factors particularly concerned with computer systems. HCI&HF is particularly concerned with issues of usability, that is, how the design of technological systems impacts how efficiently and effectively people can use those systems. When you visit a web site and cannot find what you are looking for or do what you came to do because the design of the site is bad, that's an HCI&HF problem.

HCI&HF is a STEM area and has CIP code 30.3101. HCI&HF professionals work in a wide variety of corporate and government settings on projects ranging from military systems to mobile phones, and are presently in high demand. In fact, Rice's existing HCI&HF program routinely receives requests from employers seeking students with Master's-level training. Many Psychology departments that have an HCI or HF program offer a professional Master's (e.g., University of Michigan, University of Washington, Georgia Tech, and others; see section 5 for more examples).

A Professional Masters program in HCI&HF at Rice would be well-positioned because of our national reputation and the fact that Houston has a large number of industries that have high demand for HCI&HF expertise, such such as health, energy, and aerospace. Competition is relatively limited geographically as there are few such programs in Texas: Texas Tech offers a Master's in Human Factors Psychology and the University of Houston-Clear Lake offers an

M.A. in in Psychology with a Human Factors certificate. There are some additional programs in the state that are related: the University of Texas-Austin School of Information offers an interdisciplinary M.S. in Information Studies with an HCI track and Texas A&M offers a more distantly-related M.P.H. in Occupational Safety & Health.

## **2. Learning and Assessment**

### *2.1 Student Learning Outcomes*

Upon completion of the Masters in Human Computer Interaction and Human Factors, students will:

- **Program Learning Outcome #1:** Have a clear understanding of the fundamental concepts in human factors and engineering psychology.

This outcome is covered in PSYC 540, Foundations of Human Factors and Engineering Psychology. Here, students will gain a full understanding of how humans interact with systems and how human capabilities inform the design of superior human computer systems.

- **Program Learning Outcome #2:** Have a clear understanding of human cognitive functions and limitations, and how those impact the design of systems.

Building on the fundamental work covered in PSYC 540, theory and practice in human computer interaction are expanded upon in PSYC 520, Foundations of Cognitive Psychology. Electives (of which the student must take one) supporting this outcome include PSYC 522 Information Processing and Attention, PSYC 524 Memory, PSYC 525 Psycholinguistics, PSYC 527 Decision Making/ Problem Solving, PSYC 530 Foundations of I/O Psychology, PSYC 581 Vision Science, PSYC 630 Training, and PSYC 634 Personnel Selection.

- **Program Learning Outcome #3:** Be able to specify the design of an engineering human computer system so that it supports human capabilities.

Building on the material covered in PSYC 520 and PSYC 540, PSYC 541 (Human-Computer Interaction) and PSYC 609 (Methods in Human-Computer Interaction) teach students the methods necessary to specify and evaluate human computer systems within the framework of human capabilities and limitations. Electives (of which the student must take one) supporting this outcome include PSYC 504 Computer Applications in Psychology, PSYC 543 Computational Modeling, PSYC 662 Non Traditional Interfaces, PSYC 663 Medical Human Factors, and PSYC 664 Usability Assessment.

- **Program Learning Outcome #4:** Be able to critically analyze and evaluate one's own findings and those of others.

Two courses, PSYC 502 and PSYC 503 (Advanced Psychological Statistics I and II) will teach the student how to design experiments, rigorously collect data, and then analyze that data in a way that provides the greatest insight to the problem at hand. The material learned in these courses will be used throughout the other courses as students analyze their own data and strive to interpret the findings of others in the field. Electives (of which the student must take one) supporting this outcome include PSYC 601 Multivariate Statistics and PSYC 602 Psychometrics

- **Program Learning Outcome #5:** Effectively communicate ideas, methodologies, analyses, and interpretations of the research topic.

PSYC 600, HCI&HF Master’s Capstone Project, is the capstone project that will teach students how to communicate the results of their research and human computer design ideas. It builds directly off of the fundamental courses (540/520), the application courses (609 and 541) and the experimental design/statistical analysis courses (502 and 502). This course will help students integrate all of their accumulated knowledge and teach them to present it in a way that effectively communicates their work. Depending on the nature of the students work, any of the 500-600 level elective courses will also support this outcome.

## 2.2 Curriculum Map

| All Students  | PLO 1      | PLO 2      | PLO 3      | PLO 4      | PLO 5      |
|---|------------|------------|------------|------------|------------|
| PSYC 540 – Foundations of Human Factors/ Engineering Psychology | Introduced | Introduced | Introduced | Introduced | Introduced |
| PSYC 502 – Psychological Statistics I                           | Reinforced | Reinforced |            | Introduced | Practiced  |
| PSYC 503 – Psychological Statistics II                          | Reinforced | Reinforced |            | Reinforced | Practiced  |
| PSYC 520 – Foundations of Cognitive Psychology                  | Reinforced | Introduced | Reinforced | Practiced  | Practiced  |
| PSYC 541 – Human-Computer Interaction                           | Practiced  | Practiced  | Practiced  | Practiced  | Practiced  |
| PSYC 609 – Methods in Human-Computer Interaction                | Practiced  | Practiced  | Practiced  | Practiced  | Practiced  |
| PSYC 531 –HF/HCI Research Seminar                               | Practiced  | Practiced  | Practiced  | Practiced  | Practiced  |
| PSYC 600 HCI&HF Master’s Capstone Project                       | Practiced  | Practiced  | Practiced  | Practiced  | Practiced  |

## 2.3 Assessment Plan

The Masters in Human Computer Interaction program will participate in the University’s annual program evaluation, including preparation of initial and follow-up ROARS/RIPES reports of student learning outcomes assessment. To achieve this goal, we will capture three metrics. 1) We will use student grades in the required courses to measure outcomes, 2) we will use evaluation of

the students capstone report and 3) we will survey students at the end of the program to determine gather qualitative and quantities information about the program. See Appendix A for a detailed grid describing the assessment plan.

### Direct Assessment

Direct assessment of program learning outcomes is primarily accomplished through 1) grades received in each of the relevant courses and 2) the final research capstone project report. Capstone rubrics will be applied to determine proficiency. In addition, other evidence will be evaluated as needed for various learning outcomes where the capstone report is insufficient (e.g., oral communications would be assessed by rubric during the presentation of the capstone).

### Indirect Assessment

Indirect assessments include student evaluations of individual courses, and surveys of student attitudes concerning the program and their own self-appraisal on progress toward proficiency regarding the learning outcomes.

### *2.4 Additional Reporting*

For assessment purposes, the Graduate Council will receive from the Psychology Department an evaluation of the program after three years, to include information regarding staffing, faculty involvement, student admissions, student retention, quality of instruction, and budget overview.

## **3. Faculty and Courses**

### *3.1 Primary Faculty*

These faculty have HCI&HF as one of their primary research areas and will teach all but one of the required courses.

- Michael Byrne, Professor of Psychology and Computer Science
- Patricia DeLucia, Professor of Psychology\*
- Philip Kortum, Associate Professor of Psychology
- David Lane, Associate Professor of Psychology, Statistics, and Management
- Eduardo Salas, Allyn R. & Gladys M. Cline Professor of Psychology

\* Note: Professor DeLucia will be joining the Rice faculty July 1, 2018

### *3.2 Secondary Faculty*

These faculty members are not primarily associated with the HCI&HF area but teach courses in the curriculum, primarily those that are listed as electives.

- Margaret Beier, Associate Professor of Psychology
- Michelle Hebl, Martha and Henry Malcom Lovett Professor of Psychology
- Randi Martin, Elma Schneider Professor of Psychology
- Fred Oswald, Professor of Psychology

### 3.3 Courses

The professional Master's degree requires students to complete 38 credit hours over two years. The requirements for the HCI&HF Master's would be as follows (credit hours and primary instructor is noted in parentheses):

#### Required Courses

1. Psyc 502 Advanced Psychological Statistics I (3, Byrne)
2. Psyc 503 Advanced Psychological Statistics II (3, Lane or Oswald)
3. Psyc 520 Foundations of Cognitive Psychology (3, Martin)
4. Psyc 531 Human Factors/Human-Computer Interaction Seminar series (1, rotates between Byrne, Lane, and Kortum; required all 4 semesters)
5. Psyc 540 Foundations of Engineering Psychology (3, Byrne)
6. Psyc 541 Human-Computer Interaction (3, Lane)
7. Psyc 561 Teaching in Psychology (3, all faculty)
8. Psyc 595 Summer Internship in Human-Computer Interaction and Human Factors
9. Psyc 609 Methods in Human-Computer Interaction (3, Kortum)
10. Psyc 600 HCI&HF Master's Capstone Project (6, jointly by all primary faculty)

Two elective courses, chosen from the following list:

1. Psyc 504 Computer Applications in Psychology (3, Lane)
2. Psyc 522 Information Processing and Attention (3, TBD probably DeLucia)
3. Psyc 524 Memory (3, TBD)
4. Psyc 525 Psycholinguistics (3, Martin)
5. Psyc 527 Reasoning, Decision Making, and Problem Solving (3, Byrne)
6. Psyc 530 Foundations of I/O Psychology (3, Beier or Hebl)
7. Psyc 543 Computational Modeling (3, Byrne)
8. Psyc 581 Vision Science (3, TBD probably DeLucia)
9. Psyc 601 Multivariate Statistics (3, Oswald)
10. Psyc 602 Psychometrics (3, Oswald)
11. Psyc 630 Training (3, Beier)
12. Psyc 634 Personnel Selection (3, TBD)
13. Psyc 640 Special Topics in HCI&HF (3, occasional from any primary faculty)
14. Psyc 662 Non Traditional Interfaces (3, Kortum)
15. Psyc 663 Medical Human Factors (3, Kortum)
16. Psyc 664 Usability Assessment (3, Kortum)

#### Capstone

Psyc 600 HCI&HF Master's Capstone Project is a new course specific to the MHCHI&HF program. The capstone design course would be taken in the second semester of the second year. This course would be a project course, supervised jointly by all the HCI&HF faculty. This is the only new course that would be necessary to support the program and thus no additional faculty, either full-time or adjunct, would be required to support the program. The preliminary syllabus appears in Appendix B; the course will be submitted for final approval upon approval of the MHCHI&HF program.

## Internship

All students in the Master's program would be required to intern in the summer between their two years of study. Faculty in the HCI&HF area have relationships with multiple local and national companies and government labs that would be suitable. Students sponsored by their employer may return to that company for the summer internship, provided that the work was classified as human factors-related.

### *3.4 Teaching Resources*

As the program runs almost entirely on existing courses, and these courses are generally under-subscribed, the addition of 4–5 new students will overall have no impact on other degree programs and only minor impact on faculty workload. As the existing courses have been running regularly for years without the addition of Professor DeLucia, absorbing a single new course should overall have little impact on workload. Essentially, from a course perspective, the program is already sustainable.

## **4. Resources**

The program will require no additional library and information resources; existing resources already in place are more than adequate. There would be a small amount of administrative overhead for the Psychology department in terms of handling additional applications. However, the number of applications is not expected to be large enough that this will create much of a burden, and thus no additional staff are required.

In terms of physical resources, the only new resources required would be a small amount of office space to be shared among the Master's students.

## **5. Financial Support**

Our plan is set initial tuition to \$35,000 per year, which puts us in line with with other similar programs, as can be seen in the table below.

| <b>School</b>               | <b>Program</b>   | <b>Cost (\$/year)</b> | <b>Program length (years)</b> |
|-----------------------------|--|-----------------------|-------------------------------|
| University of Texas- Austin | Information Studies  | 17172                 | 2                             |
| University of Washington    | Human Centered Design and Engineering                      | 18000                 | 2                             |
| George Mason University     | Human Factors and Applied Cognition                        | 19515                 | 2                             |
| University of Virginia      | Human-Computer Interaction / Cognitive Systems Engineering | 25578                 | 2                             |
| Georgia Tech                | Engineering Psychology                                     | 34140                 | 2.5                           |
| <b>Rice University</b>      | <b>Human Factors/Human-Computer Interaction</b>            | <b>35000</b>          | <b>2</b>                      |

|                                   |                                 |       |     |
|-----------------------------------|---------------------------------|-------|-----|
| Rochester Institute of Technology | Experimental Psychology         | 41804 | 1.5 |
| Catholic University               | Applied-Experimental Psychology | 42850 | 2   |
| University of Michigan            | Human-Computer Interaction      | 43346 | 2   |
| Carnegie Mellon University        | Human-Computer Interaction      | 46000 | 1.5 |

\* State school tuition is based on out-of-state status

Note that there is a substantial range in terms of credit hours required across these programs as not all universities count credit hours the same way Rice does.

As previously noted, this program requires negligible departmental and school-level resources. The goal would be to enroll 4–5 students per year. At 4–5 students per year, no additional overhead will be necessary, so there is no contingency needed. The resulting tuition dollars would be split 80/20 between the department and the school of Social Sciences. These funds retained by the department would be used to support additional HCI&HF Ph.D. students. Here is the projected five-year budget:

|                                | FY19           |    | FY20           |         | FY21           |         | FY22           |         | FY23           |         |
|--------------------------------|----------------|----|----------------|---------|----------------|---------|----------------|---------|----------------|---------|
|                                | NS             | CS | NS             | CS      | NS             | CS      | NS             | CS      | NS             | CS      |
| Enrollment                     | 5              |    | 5              | 5       | 5              | 5       | 5              | 5       | 5              | 5       |
| <b>Revenue</b>                 |                |    |                |         |                |         |                |         |                |         |
| Tuition                        | 35,000         | -  | 35,000         | 35,000  | 35,000         | 35,000  | 35,000         | 35,000  | 35,000         | 35,000  |
| Tuition Recovery               | 175,000        |    | 175,000        | 175,000 | 175,000        | 175,000 | 175,000        | 175,000 | 175,000        | 175,000 |
| <b>Gross Total</b>             | <b>175,000</b> |    | <b>350,000</b> |         | <b>350,000</b> |         | <b>350,000</b> |         | <b>350,000</b> |         |
| <b>20% of Gross to Central</b> | 35,000         |    | 70,000         |         | 70,000         |         | 70,000         |         | 70,000         |         |
| <b>Net</b>                     | 140,000        |    | 280,000        |         | 280,000        |         | 280,000        |         | 280,000        |         |

NS= New Students  
CS= Continuing Students

## 6. Administration

The target enrollment will be 4–5 full-time students per year with Fall admission only. This requires minimal administrative load, primarily in the application process. Carrie Smith in Psychology will handle the administrative side of the additional applications; however, they will not procedurally be treated differently from her perspective.

There are still key responsibilities that will be shared among the core HCI&HF faculty. First, admissions. A rotating subset of 3 HCI&HF faculty will review all applications and select the top applications. The application process will be the same as the current Ph.D. admissions process in terms of deadlines and application materials submitted, with the expectation that standards will be somewhat different. In particular, while we expect the overall quality of the students to be similar in terms of GPA and GRE scores, their interests will be different. Ph.D. students are

focussed on research and thus research experience factors heavily into the admissions decision for them. The Master's students, however, will be more motivated by application and thus professional experience will be weighted more heavily for them. TOEFL standards will be the same as for the Ph.D. program. Students who meet the TOEFL requirements and are admitted but subsequently struggle will be assisted in consultation with Rice's Center for Written, Oral, and Visual Communication.

We do not presently have plans for an accelerated B.A./Master's five-year program, but we may consider this in the future if there is sufficient demand. Similarly, we have no plans to accept transfer students into the program, but this may also be re-considered in the future if there is demonstrated demand.

Each enrolled student will be advised by one of the HCI&HF faculty, to be matched based on interest. The faculty member will have regular meetings with the advisee to track progress. In addition, the HCI&HF faculty will meet after the completion of each non-graduating semester to formally evaluate each student's progress and provide written feedback to the student.

## **7. Degree Requirements**

### **Summary**

Total Credit Hours Required for the MHCI&HF Degree 38

#### Degree Requirements

##### — Required Courses

PSYC 502 Advanced Psychological Statistics I (3)

PSYC 503 Advanced Psychological Statistics II (3)

PSYC 520 Foundations of Cognitive Psychology (3)

PSYC 531 Human Factors/Human-Computer Interaction Seminar (1, repeated)

PSYC 540 Foundations of Engineering Psychology (3)

PSYC 541 Human-Computer Interaction (3)

PSYC 561 Teaching in Psychology (3)

PSYC 595 Summer Internship in Human-Computer Interaction and Human Factors (1)

PSYC 609 Methods in Human-Computer Interaction (3)

PSYC 600 HCI&HF Master's Capstone Project (6)

##### — Elective Requirements (6)

Total Credit Hours 38

For more detail on Degree Requirements, please see the proposed GA text, as Appendix C.

## **8. Launch**

We would launch as soon as possible, preferably we would begin accepting applications starting December 2018 for enrollment in Fall of 2019. The application deadline would be the same as for the Ph.D. program and would require the same application materials, thus minimizing administrative overhead.

# Appendix A: Assessment Plan for MHCI&HF

| <b>Assessment Plan for Masters in Human Computer Interaction</b>  |  |
|---|--|
| <b>Learning Outcomes</b>  | <p><b>Program Learning Outcome #1:</b> Have a clear understanding of the fundamental concepts in human factors and engineering psychology</p> <p><b>Program Learning Outcome #2:</b> Have a clear understanding of human cognitive functions and limitations, and how those impact the design of systems.</p> <p><b>Program Learning Outcome #3:</b> Be able to specify the design of an engineering human computer system so that it supports human capabilities.</p> <p><b>Program Learning Outcome #4:</b> Be able to critically analyze and evaluate one's own findings and those of others.</p> <p><b>Program Learning Outcome #5:</b> Effectively communicate ideas, methodologies, analyses, and interpretations of the research topic.</p> |
| <b>Embedded location (Where?)</b>                                 | <p>PSYC 540 Foundations of HF<br/>PSYC 500-693 level classes<br/>PSYC 573 Capstone Research</p> <p>PSYC 520 Foundations of Cognitive Psych<br/>PSYC 500-693 level classes<br/>PSYC 573 Capstone Research</p> <p>PSYC 541 Human Computer Interaction<br/>PSY 009 Method in HCI<br/>PSYC 500-693 level classes<br/>PSYC 573 Capstone Research</p> <p>PSYC 502 Psychological Statistics I<br/>PSYC 502 Psychological Statistics II<br/>PSYC 500-693 level classes<br/>PSYC 573 Capstone Research</p>  |
| <b>Materials (What?)</b>  | <p>Grade roster</p> <p>Student course and faculty evaluations</p> <p>Graduate Exit survey</p> <p>Capstone project report</p>   |
| <b>Measure (How?)</b>   | <p><b>Direct Measures:</b><br/>Course grades and rubric scored capstone report</p> <p><b>Indirect Measures:</b><br/>Student evaluations of individual courses<br/>Graduate exit survey</p>   |
| <b>Standard (To what extent?)</b>                                 | <p><b>Direct measures:</b></p> <ol style="list-style-type: none"> <li>1) Average GPA for students must be at least 3.0</li> <li>2) The average of all Capstone reports will be 3 (proficient) on the scoring rubric (to be developed)</li> </ol> <p><b>Indirect measures:</b><br/>Student Evaluations Survey - Courses should obtain an average of 3.5 on the effectiveness measurement</p> <p><b>Graduate exit survey - 80% of graduate respondents will "Strongly Agree/Agree" that courses in the program gave them an opportunity to meet this PLO.</b></p>  |
| <b>Responsible (Who?)</b>   | <p>HF area coordinator<br/>Faculty steering committee<br/>Department Chair</p>   |
| <b>Timeline (When?)</b>   | <p>Review: 2019-2020</p> <p>Follow-up: 2022-2023</p>   |
| <b>Who receives results and who is responsible for follow-up?</b> | <p>HF area coordinator<br/>Faculty steering committee<br/>Department Chair</p>   |

## **Appendix B: Preliminary Syllabus for PSYC 600**

Rice University  
Department of Psychology

### **PSYC 600: HCI/HF Capstone**

#### **Instructor**

TBD

Email: TBD

713-348-xxxx

Office Hours by appointment

#### **Course Summary:**

This course allows students to integrate all of the knowledge they have gained in their HCI/HF coursework in the form of a capstone project in the area of human-computer interaction and human factors. The capstone may be either research focused or application focused.

Research-based projects will conduct original research in an area that has been mutually agreed upon by the student and the HCI/HF graduate committee. Application-focused projects will apply fundamental user-centered design principles in the design, iteration, and evaluation of product, service, or system that has been mutually agreed upon by the student and the HCI/HF Graduate Committee.

Both research and application capstones include a written component, consisting of an APA compliant report of sufficient length to cover the material, and a presentation component, in which the student presents the work to the HCI/HF seminar course.

#### **Required Texts:**

There are no required texts for this course

#### **Learning Outcomes:**

At the end of this course, students will:

- 1) Have a clear understanding of how to apply the fundamental concepts in human factors and ergonomics to research or in a user-centered process
- 2) Understand how limits of human cognition and perception impact engineering design, and applied those to a specific problem
- 3) Be able to present a summary of their knowledge in a written format suitable for a broad audience
- 4) Be able to present a summary of their knowledge in an oral format suitable for a broad audience

#### **Evaluation**

The capstone project grade will be based on the written portion of the capstone (75%) and the oral component (25%). The student's advisor will be the instructor or record for the purposes of grading the oral and written portions of the capstone.

| <b>Week</b> | <b>Action</b>  |
|-------------|--|
| 1           | Select a topic/ advisor selection and forward a summary to the HCI/HF Graduate Committee |
| 2           | Graduate Committee approves the capstone project   |
| 3           | Meet with advisor  |
| 4           | Meet with advisor  |
| 5           | Meet with advisor  |
| 6           | Meet with advisor  |
| 7           | Progress report to the Graduate Committee and Advisor due                                |
| 8           | Meet with advisor  |
| 9           | Meet with advisor  |
| 10          | Meet with advisor  |
| 11          | Meet with advisor  |
| 12          | Meet with advisor  |
| 13          | Meet with advisor  |
| 14          | Capstone oral presentation   |
| 15          | Capstone written report due  |

### **Disabilities**

Any student with a disability requiring accommodations in this course is encouraged to contact me after class or during office hours. Additionally, students will need to contact Disability Support Services

### **Honor System Policy**

*As with all endeavors at Rice, you are expected to adhere to the Honor Code and follow the guidelines given in the Honor code Handbook. The capstone work must reflect the students own effort and student must attest that, on their honor, they have neither given nor received any unauthorized aid on their capstone project. Students are encouraged to bring any concerns involving academic integrity to the attention of the instructor.*  
*Appendix B: Assessment Plan for MHCI&HF*

## Appendix C. Proposed General Announcements Text

This proposed new degree program will be referenced in two different places in the General Announcements (i.e., students can access it through two different entries in the **Programs of Study** section):

- A) under Psychology, in the Graduate tab, under “Master’s Programs”
- B) under Human-Computer Interaction and Human Factors, a new entry in the **Programs of Study** section;

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### General Announcements – Text A. (Psychology)

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## Psychology



### Master's Program

- [Master of Human-Computer Interaction and Human Factors \(MHCI\) Degree \(NEW\)](#)
- Master of Arts (MA) Degree in the field of Psychology\*

### Doctoral Program

- [Doctor of Philosophy \(PhD\) Degree in the field of Psychology](#)

\* Although students are not normally admitted to a Master of Arts (MA) degree program, graduate students may earn the MA as they work towards the PhD.

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### General Announcements – Text B. (Human-Computer Interaction and Human Factors)

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## Human-Computer Interaction and Human Factors



Human-Computer Interaction (HCI) and Human Factors (HF). Human Factors is the scientific consideration of people in the design of products, services and systems. Human Factors is responsible for ensuring that systems meet the needs and expectations of the user, and more importantly, conform to the capabilities and limitations of those users. Human Factors can increase the ability of users to effectively use complex systems and enhance the safety of those systems. Human Factors focuses much of its efforts to the study of complex human-machine interfaces such as automobile controls, aircraft cockpits, medical devices, and many others. HCI is the subarea within human factors particularly concerned with computer systems. HCI&HF is particularly concerned with issues of usability, that is, how the design of technological systems impacts how efficiently and effectively people can use those systems.

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# Human-Computer Interaction and Human Factors



## Master's Program

- [Master of Human-Computer Interaction and Human Factors \(MHCI\) Degree \(NEW\)](#)

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**General Announcements: Human-Computer Interaction and Human Factors  
(Below is the GA Text: Program-Specific Detail, specific to the new MHCI degree)**

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## Master of Human-Computer Interaction and Human Factors (MHCI) Degree



Upon completing the MHCI degree, students will:

1. Have a clear understanding of the fundamental concepts in human factors and engineering psychology.
2. Have a clear understanding of human cognitive functions and limitations, and how those impact the design of systems.
3. Be able to specify the design of an engineering human computer system so that it supports human capabilities.
4. Be able to critically analyze and evaluate one's own findings and those of others.
5. Effectively communicate ideas, methodologies, analyses, and interpretations of the research topic.

## Master of Human-Computer Interaction and Human Factors (MHCI) Degree



### Requirements for the MHCI Degree

The MHCI degree is a non-thesis master's degree. For general university requirements, please see [Non-Thesis Master's Degrees](#). Students pursuing the MHCI degree must complete:

- A minimum of 11 courses (38 credit hours) of approved coursework at the 500-level or higher.
- A minimum of 8 courses (24 credit hours) must be taken at Rice University.
- A minimum overall GPA of 3.0 in required coursework.

- A maximum of 2 courses (6 credit hours) from transfer credit. For additional departmental guidelines regarding transfer credit, see the Policies tab.
- A capstone design course. (This is to be a project course, supervised jointly by all the HF/HCI faculty, and should be taken in the second semester of the second year.)
- An internship <sup>1</sup>. All students in the Master's program are required to intern in the summer between their two years of study

## Summary

|   |    |
|---|----|
| Total Credit Hours Required for the MHCI degree | 38 |
|---|----|

## Degree Requirements

| <b>Core Requirements</b>            |   |   |
|-------------------------------------|---|---|
| PSYC 502                            | <i>Advanced Psychological Statistics</i>                        | 3 |
| PSYC 503                            | <i>Advanced Psychological Statistics II</i>                     | 3 |
| PSYC 520                            | <i>Foundations of Cognitive Psychology</i>                      | 3 |
| PSYC 531                            | <i>Human Factors/Human-Computer Interactions Seminar Series</i> | 1 |
| PSYC 540                            | <i>Foundations of Engineering Psychology</i>                    | 3 |
| PSYC 541                            | <i>Human-Computer Interaction</i>                               | 3 |
| PSYC 561                            | <i>Teaching in Psychology</i>                                   | 3 |
| PSYC 595 (NEW)                      | <i>Summer Internship in HCI&amp;HF</i>                          | 1 |
| PSYC 609                            | <i>Methods in Human-Computer Interaction</i>                    | 3 |
| PSYC 600 (NEW)                      | <i>Capstone</i>   | 6 |
| <b>Elective Requirements</b>        |   |   |
| <i>Select 2 from the following:</i> |   |   |
| PSYC 504                            | <i>Computer Applications in Psychology</i>                      | 3 |
| PSYC 522                            | <i>Info Processing &amp; Attention</i>                          | 3 |
| PSYC 524                            | <i>Memory</i>   | 3 |
| PSYC 525                            | <i>Psycholinguistics</i>  | 3 |
| PSYC 527                            | <i>Reasoning, Decision Making, and Problem Solving</i>          | 3 |
| PSYC 530                            | <i>Foundations of I/O Psychology</i>                            | 3 |
| PSYC 543                            | <i>Computational Modeling</i>                                   | 3 |
| PSYC 581                            | <i>Vision Science</i>   | 3 |
| PSYC 601                            | <i>Multivariate Statistics</i>                                  | 3 |
| PSYC 602                            | <i>Psychometrics</i>  | 3 |
| PSYC 630                            | <i>Training</i>   | 3 |
| PSYC 634                            | <i>Personnel Selection</i>                                      | 3 |
| PSYC 640                            | <i>Special Topics in HCI&amp;HF</i>                             | 3 |

|                           |                                   |           |
|---------------------------|-----------------------------------|-----------|
| PSYC 662                  | <i>Non Traditional Interfaces</i> | 3         |
| PSYC 663                  | <i>Medical Human Factors</i>      | 3         |
| PSYC 664                  | <i>Usability Assessment</i>       | 3         |
| <b>Total Credit Hours</b> |                                   | <b>38</b> |

### Footnotes and Additional Information

<sup>1</sup> All students in the Master's program are required to intern in the summer between their two years of study. Faculty in the HCI/HF area have relationships with multiple local and national companies and government labs that would be suitable. Students sponsored by their employer may return to that company for the summer internship, provided that the work was classified as human factors-related.

### Proposed Plan-of-Study

The following plan-of-study represents the lockstep two-semester sequence in which students pursuing the MHCI degree complete the required coursework.

|                                     |   |           |
|-------------------------------------|---|-----------|
| <b><i>First Semester (Fall)</i></b> |   |           |
| PSYC 531                            | <i>Human Factors/Human-Computer Interaction Seminar</i> | 1         |
| PSYC 502                            | <i>Advanced Psychological Statistics</i>                | 3         |
| PSYC 541                            | <i>Human-Computer Interactions</i>                      | 3         |
| PSYC 609                            | <i>Methods in Human-Computer Interactions</i>           | 3         |
| <b>Total Credit Hours</b>           |   | <b>10</b> |

|  |   |           |
|--|---|-----------|
| <b><i>Second Semester (Spring)</i></b> |   |           |
| PSYC 531                               | <i>Human Factors/Human-Computer Interaction Seminar</i> | 1         |
| PSYC 503                               | <i>Advanced Psychological Statistics II</i>             | 3         |
| PSYC 540                               | <i>Foundations of Engineering Psychology</i>            | 3         |
| PSYC 561                               | <i>Teaching in Psychology</i>                           | 3         |
| <b>Total Credit Hours</b>              |   | <b>10</b> |

|                           |  |          |
|---------------------------|--|----------|
| <b><i>Summer</i></b>      |  |          |
| PSYC 595 (NEW)            | <i>Summer Internship in HCI&amp;HF</i> | 3        |
| <b>Total Credit Hours</b> |  | <b>3</b> |

|                                     |   |          |
|-------------------------------------|---|----------|
| <b><i>Third Semester (Fall)</i></b> |   |          |
| PSYC 531                            | <i>Human Factors/Human-Computer Interaction Seminar</i> | 1        |
| PSYC 520                            | <i>Foundations of Cognitive Psychology</i>              | 3        |
| Elective one                        | <i>Elective one</i>                                     | 3        |
| <b>Total Credit Hours</b>           |   | <b>7</b> |

| <b>Fourth Semester (Spring)</b> |  |           |
|---------------------------------|--|-----------|
| PSYC 531                        | Human Factors/Human-Computer Interaction Seminar | 1         |
| Elective two                    | Elective two                                     | 3         |
| PSYC 600 (NEW)                  | Capstone   | 6         |
| <b>Total Credit Hours</b>       |  | <b>10</b> |

## Master of Human-Computer Interaction and Human Factors (MHCI) Degree

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### Policies for the MHCI Degree

#### Department of Psychology Graduate Program Handbook

The General Announcements (GA) is the official Rice curriculum. As an additional resource for students, the department of Psychology, the home department for the Human-Computer Interaction and Human Factors program, publishes a graduate program handbook, which can be found here: [http://gradhandbooks.rice.edu/2017\\_18/Psychology\\_Graduate\\_Handbook.pdf](http://gradhandbooks.rice.edu/2017_18/Psychology_Graduate_Handbook.pdf)

#### Admission

Admission to graduate study in Industrial Engineering is open to qualified students holding a BS or a BA degree in a quantitative field from an accredited institution. The MIE degree governing committee will evaluate the previous academic record and credentials of each applicant individually, and will make all admissions decisions.

#### Financial Aid

No financial aid is available from Rice University or the Psychology Department for students in the MHCI degree program.

#### Transfer Credit

For Rice University's policy regarding transfer credit, see [Transfer Credit](#). Some departments and programs have additional restrictions on transfer credit. Students are encouraged to meet with their academic program's advisor when considering transfer credit possibilities.

#### Departmental Transfer Credit Guidelines

Students pursuing the MHCI degree should be aware of the following departmental transfer credit guidelines:

- No more than 2 courses (6 credit hours) of transfer credit from U.S. or international universities of similar standing at Rice may apply towards the degree. Transferred courses must be comparable in content and depth to the corresponding course at Rice, and must not have counted toward another degree.
- Requests for transfer credit will be considered by the program director (and/or the program's official transfer credit advisor) on an individual case-by-case basis.

#### Additional Information

For additional information, please see the Psychology website: <https://psychology.rice.edu/>

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## Master of Human-Computer Interaction and Human Factors (MHCI) Degree

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Outcomes

Requirements

Policies

Opportunities

### Opportunities for the MHCI Degree

#### Additional Information

For additional information, please see the Psychology website: <https://psychology.rice.edu/>



**Eduardo Salas, Ph.D.**  
Allyn R. & Gladys M. Cline Professor of Psychology  
Chair, Department of Psychology

September 29, 2017

Dear Dr. April DeConick,

I am pleased to submit the Department of Psychology's proposal for a new Master's degree in Human Computer Interaction and Human Factors (MHCI&HF). This program will train students to work in the exciting and growing field of human-computer interaction. Graduates of this program will be able to join the ranks of influential companies like Google, Facebook, and Amazon, and help those companies to design computing systems that are easy to use and meet user needs.

This new program will train some of the best professionals in HCI, and will further bolster Rice's reputation for excellence in the field. The program has been specifically designed to integrate seamlessly into the existing degree programs in the department in order to ensure that this new degree program can be successful quickly and with a minimum of effort. The full rationale for the program can be found in the attached proposal.

I am fully supportive of this new degree program, and look forward to its approval and implementation.

Regards,

A handwritten signature in black ink, appearing to read 'E. Salas'.

Eduardo Salas  
Professor and Allyn R. & Gladys M. Cline Chair,  
Chair, Department of Psychology  
Rice University



**Antonio M. Merlo, Ph.D.**

*Dean of the School of Social Sciences and  
George A. Peterkin Professor of Economics*

October 11, 2017

**MEMORANDUM**

To: Graduate Curriculum Committee

From: Antonio Merlo 

Re: Support of the Professional Masters in Human-Computer Interaction and Human Factors

I enthusiastically endorse the proposal by the Department of Psychology to create a Professional Masters degree in Human-Computer Interaction and Human Factors. Rice has an excellent reputation in this field and has already trained many undergraduates and doctoral students. The new degree program will permit Rice to train people interested to pursue careers in this applied area of Psychology where there is demand from industry and government for people with Master's level training. The program is well-balanced. It has a strong curriculum and a strong faculty to deliver it. In short, the Department of Psychology is addressing an important need and is well equipped to deliver. It will be a program that will provide excellent training for students and it will enhance the reputation of the Department of Psychology, the School of Social Sciences, and Rice University.



**Seiichi P. T. Matsuda**  
Dean of Graduate and Postdoctoral Studies  
E. Dell Butcher Professor of Chemistry  
Professor of BioSciences

October 10, 2017

Professor April DeConick  
Chair, Graduate Council

Dear April,

I enthusiastically support the proposal for the Master of Human-Computer Interaction and Human Factors.

I expect the program to be strategically valuable to the university. Our Psychology faculty has a very strong national and international reputation in the discipline. Houston and the broader region have substantial need for people with expertise in Human Factors, so the program should quickly compete for superb scholars. The program is thoughtfully constructed from established, proven courses and so we can have high confidence that the students will get a strong education from the beginning. The leadership team and structure are strong.

The Budget Office has reviewed the proposal and reports that there are no issues with the budget. This structure imposes little new cost at the departmental level and so a small entering class as proposed should work fine, but it is easy to see potential to grow the program and use resources to hire additional staffing as necessary. A 20% share of the gross income would stay with Central as is standard.

Thanks to Psychology and its leadership for a fine proposal.

With best regards,

A handwritten signature in black ink that reads 'Seiichi Matsuda'.

Seiichi P. T. Matsuda  
Dean of Graduate and Postdoctoral Studies