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WELCOME to the Mathematics and Science Education Doctoral Program (MSED)!

This handbook has been created to provide doctoral students and participating faculty with an orientation to the MSED program and to articulate the rules and policies governing the program. We have tried to answer questions that typically arise for students and faculty in the program. Our goal is to help contribute to you having a positive, productive, and enriching experience in the program. Please note: Information in the printed SDSU and UCSD Graduate Bulletins supersedes any other information from alternate sources, including this one.

– The MSED Steering Committee

Useful Contact Information

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<th>Who</th>
<th>For What</th>
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</table>
| Meredith Houle Vaughn, Graduate Advisor for MSED at SDSU | • Professional mentor: identify experiences to help you develop important professional skills, with a focus on activities that go beyond the core course requirements  
• Course substitutions (both advisors need to sign off)  
• Advice regarding SDSU research rotations (MSE 802), first year projects (MSE 820), & teaching practicum (MSE 805, 806 or 807)  
• Information on science education courses available at SDSU  
• 1st and 2nd year evaluations |
| Joanne Lobato, MSED Co-Director at SDSU | • Guidance meeting course requirements; rules related to fees and registration  
• Send 801 work to Joanne by end of Fall semester of Year 1  
• Rules regarding first year projects  
• Second year exam – rules, content, and committees  
• Project placement: RA/TA for next year  
• Interest in working with a non-MSED faculty at SDSU  
• Issues that arise with an SDSU faculty member  
• Trouble with an RAship at SDSU  
• Dissertation proposal and committee composition  
• Academic probation; Leave of absence |
| Supervisor of your research assistantship | • Negotiation of work assignment, including vacation time  
• Pay issues (see Deb also)  
• Work related items |
| Deb Escamilla, MSED Administrative Assistant | • All SDSU administrative issues  
• MSE schedule numbers for registration; SDSU registration issues  
• All JDP forms  
• Issues related to office supplies, equipment, phone  
• Reserving rooms at CRMSE  
• Issues related to pay periods, time sheets, and health insurance  
• Questions about UCSD housing  
• Miscellaneous Student Fee waivers  
• Logistics, timeline and forms regarding proposal defense, dissertation, dissertation defense, graduation |
| Candace Cabral CRMSE Administrative Coordinator | • General office questions when Deb is unavailable |
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<th>Who</th>
<th>For What</th>
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| Chris Halter  
Graduate Advisor for  
MSED at UCSD | • Professional mentor: identify experiences to help you develop important professional skills, with a focus on activities that go beyond the core course requirements  
• Course substitutions (both advisors need to sign off)  
• Advice regarding UCSD research rotations (MSED 295), first year projects (MSED 298), & teaching practicum (MSED 294)  
• Information about UCSD courses  
• 1st and 2nd year evaluations |
| Jeff Rabin and  
Gabriele Wienhausen,  
MSED Co-Directors at  
UCSD | • Interest in working with a non-MSED UCSD faculty  
• Help finding UCSD members for second year and dissertation committees  
• Issues that arise with a UCSD faculty member  
• Trouble with an RA or TAship at UCSD  
• Academic probation at UCSD |
| Sherry Seethaler,  
Administrative  
Assistant at UCSD | • All UCSD administrative issues  
• PIN, PAC, registration at UCSD  
• Pay issues for TA or RAship at UCSD  
• Graduation requirements at UCSD  
• Concerns regarding the MSED student office at UCSD |

---

**Gabriele Wienhausen**  
**Sherry Seethaler**  
**Candace Cabral**  
**Meredith Houle Vaughn**  
**Chris Halter**  
**Jeff Rabin**  
**Joanne Lobato**  
**Deb Escamilla**
Components of the Program

MSED is interdisciplinary in nature. Students take courses in cognitive science, sociology, philosophy, history, and psychology, in addition to taking courses and having research apprenticeship experiences in mathematics and science education research. The core course requirements address the following components and disciplines:

<table>
<thead>
<tr>
<th>Cognitive Science</th>
<th>Mathematics &amp; Science Education</th>
<th>Sociology, Philosophy, History</th>
<th>Research Apprenticeship Experiences</th>
<th>Quantitative &amp; Qualitative Methods</th>
<th>Teaching Practicum</th>
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</thead>
</table>

The requirements are designed to enable students to:

- develop an understanding of various theoretical perspectives on cognition and learning
- acquire knowledge, via course work and apprenticeship experiences, of the research methods that are necessary for examining the processes of learning and teaching
- understand how people learn mathematical or scientific concepts in part by becoming familiar with existing research on learning and teaching in mathematics and science; and
- gain insight into learners’ conceptions and perspectives through teaching experiences.

A unique feature of MSED is the balanced emphases on: (a) core coursework across a variety of disciplines, (b) regular research apprenticeship experiences, and (c) teaching practicum. An overview of each major area of emphasis is provided in Sections A, B, and C below.

A. Required Courses

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<tr>
<th>Component</th>
<th>Courses</th>
<th>Description</th>
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<tr>
<td>Research Apprenticeship</td>
<td>Faculty Interviews (MSE 801)</td>
<td>During their first year, students interview 8 faculty members from both campuses and write a 1-page summary of each interview.</td>
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<td></td>
<td>Three Research Rotations: MSE 802 and MSE 295</td>
<td>Students have practical experience with 3 different research projects (at least one on each campus); Each involves 30 hours of work.</td>
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<td></td>
<td>First Year Research Project: MSE 820; or MSE 298</td>
<td>Students design and conduct an empirical study under the supervision of a faculty member. Students typically collect data in the summer following their first year and analyze and report their findings during the beginning of their second year.</td>
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</table>
| Cognitive Science | Two courses at UCSD selected from:  
• Distributed Cognition (COGS 234 or 102A)  
• Seminar on Special Topics (COGS 260)  
• Cognitive Science Seminar (COGS 200)  
• Everyday Cognition (COGS 102B)  
• Cognitive Theory (one of COGS101 A, B, or C) | UCSD is recognized internationally as a leading center of cognitive science. In courses and seminars, students explore questions such as the following: What is the nature of intelligent activity? What are possible computational and biological mechanisms underlying such activity? What is the role of the environment (cultural and social as well as physical) in supporting and enabling cognition? |
| Theoretical Perspectives in Mathematics & Science Education | Seminar in Mathematics and Science Education (MSED 296 ABC (UCSD)) | International, as well as US, theories and research about how students learn mathematics and science from elementary school through college, what mathematics and science they are expected to learn, and ways of helping them learn (i.e., teaching them) are studied. |
|  | Learning Theories (MTHED 603) (SDSU) | The application of several major learning theories to research on the learning and teaching of mathematics and science. |
|  | Science Education Seminar (MSED 290) required for science educators | Research on the learning and teaching of science at the K-14 level is explored. Issues include students’ conceptions, the nature of science, and innovative curricular approaches. |
| Two Seminars taught at SDSU, selected from the following, required for mathematics educators:  
• Mathematics in the Early Grades (MTHED 600)  
• Mathematics in the Middle Grades (MTHED 601)  
• Teaching Mathematics (MTHED 604)  
• Algebra in the 7-14 Curriculum (MTHED 605)  
• Geometry, Probability, Statistics in the 7-14 Curriculum (MTHED 606)  
• Research on Undergraduate Mathematics Education (MTHED 607) | In MTHED 600 and 601, students explore research in the teaching and learning of mathematics in Grades K-4 and Grades 5-8, respectively. MTHED 604 addresses the research on teaching practices in mathematics, teacher knowledge, and teacher learning. MTHED 605 and 606 students investigate the research on students’ conceptions of a variety of topics in important content areas (such as algebra and geometry, respectively) at the secondary and lower-division undergraduate levels. Innovative pedagogical approaches are also investigated. MTHED 607 explores the research on teaching and learning mathematics at the undergraduate level. |
| Research Methods | Quantitative Methods:  
• PSYC 201AB (UCSD) or  
• MATH 282AB (UCSD) or  
• PSY 670AB (SDSU) | Statistical methods and the mathematical treatment of data are explored, with special reference to research in psychology. |
Qualitative methods are explored, such as clinical interviewing, verbal protocol analysis, grounded theory, design experiments, and interactional analysis.

Students work with a supervising faculty member to create an experience in which they will assist or teach prospective teachers, undergraduates, or K-12 students.

Students work with their advisors to select a total of two courses, chosen from different categories, according to the needs and background of the student:

**Philosophy & History.** Philosophy of Science (PHIL 145); Philosophy of Biology (PHIL 146); Philosophy of Physics (PHIL 147); Seminar on Science Studies (PHIL 209A); History of Science (HISC 106, 107, 108, 109, 160/260, 163/263, 164/264, 165/265). (All courses offered at UCSD.)

**Sociology.** Sociology of Education (SocG 270); Social Organization of Education (SocC 126/EDS 126); Language, Culture, & Education (SocB 117/EDS 117). (All courses offered at UCSD.)

**Mathematics & Science.** Graduate level courses in mathematics, chemistry, biology, or physics at either campus.

**Teaching Experience.** An option for students who have not yet had teaching experiences at both the K-12 and collegiate levels is to take a second teaching practicum at either campus.

**Other.** Other types of courses (at the graduate or upper division undergraduate level at either campus) can be approved by the advisors if they contribute to a coherent program.

Students present ongoing dissertation research for discussion and critique.

Independent study and research for the doctoral dissertation.

**B. Research Apprenticeship Component**

The research apprenticeship strand is an important component of the required course of study. During the first semester, the student interviews eight faculty members from both campuses and writes a one-page summary of each interview (MSE 801). As a result of the interview process, the student locates three research projects of interest to them for the research rotations (MSE 802 and MSED 295). By working briefly with three different research projects, the student is introduced to the practice and culture of a variety of research projects. Near the end of the first year, the student locates a supervising faculty for the First Year Research Project (MSE 820 or...
MSED 298) and designs a study. The data are collected and analyzed during the summer of the student’s first year. The goal is for the student to begin to carry out some research tasks independently. By the end of the third year, each student presents an appropriate thesis problem for approval to the Dissertation Committee. Concurrently with the program of study, students participate in research apprenticeship experiences through their research assistantships. Students also attend seminars, colloquia, video club, and “brown bag” sessions in which faculty, students, and visiting scholars describe their research. Each of the three main components of the research apprenticeship strand is described in greater detail below.

### i. Interviews of Faculty: MSE 801

The purpose of MSE 801 is to familiarize students with the research of a variety of faculty members. Students register for MSE 801 fall semester of the first year. They select (a minimum of) 8 MSED faculty from both campuses to interview by reading about the research projects on the MSED web site. All of the students who are interested in interviewing a particular faculty member are encouraged to interview that faculty at one time. Each student is responsible for writing a summary. Students should write 2/3 to 1 page per faculty, summarizing the research interests and possibly the educational background of each faculty. Students should not cut-and-paste summaries from web sites. The reports should be personal and reflect the nature of the conversation that occurred during the interview. Students should compile eight summaries into a single document and email the report to the MSED Co-Director at SDSU (Joanne Lobato) no later than the last day of finals of the fall semester of their first year. Faculty can be contacted via phone or email at the numbers and addresses that follow.

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<tr>
<th>SDSU</th>
<th>Faculty</th>
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## ii. Research Rotations: MSE 802 at SDSU & MSED 295 at UCSD

### Purpose.
The purpose of the research rotations is to introduce students to the practice and culture of a variety of research projects. The rotations should serve primarily as research experiences rather than as experiences in curricular design or teacher professional development.

### Background.
The rotations are part of the research apprenticeship component of the MSED program, which includes MSE 801, 802, and 820. While interviewing eight faculty members for MSE 801, students identify two research projects to investigate in greater depth in their rotations (MSE 802/MSED 295). Later, students focus on one project and develop research skills by collecting and analyzing data for their first year research project (MSE 820/MSED 298).

### Expectations.
Students arrange two research rotations -- one on each campus. Each rotation should entail a total of approximately 30 hours of work. Before the rotation begins, the student meets with the supervising faculty member of the rotation to reach an agreement regarding the specific tasks that the student will perform. To familiarize the student with a research project, the faculty member may ask the student, as part of the rotation, to attend research team meetings, read the grant proposal, and discuss research papers emanating from the project. To become immersed in the practices of the research group, the student may be asked to perform some typical activities of the group. These could include activities similar to the following: (a)
transcribing video-taped data and describing the subjects’ ways of thinking, (b) interviewing a “practice” subject, (c) designing interview tasks, (d) locating and summarizing literature sources, or (e) coding a small subset of data using an extant coding system. Examples of activities that extend beyond the scope of a rotation and are not recommended include the following: (a) writing or presenting a paper with a faculty member, (b) conducting analysis without a given coding system, (c) expecting the student to collect usable interview data for the project. In some circumstances, the faculty member may develop an interest in working with the student to do something like presenting a paper at a conference, but that additional work should be separate from the completion of the rotation. Finally, at the conclusion of the rotation, the student needs to prepare a brief written report (2-3 pages) of his or her reflections on the experience. The third rotation is the same for all Year 1 students and focuses on learning about the grant writing process. Activities include researching externally funded grant programs, reading sample grant proposals, and becoming knowledgeable about the panel review process. A different faculty member, from either campus, will lead this rotation each year.

**Process.** For two of the rotations, the student identifies an MSED faculty member who is conducting research of interest to the student and who is willing to supervise a rotation. The student arranges a meeting with the faculty member, in which they agree upon the specific nature of the rotation activities. Prior to the start of the rotation, the student creates a short description of the agreed-upon activities and emails it to both the faculty member and the MSED Co-Director (the SDSU Co-Director for MSE 802 or the UCSD Co-Director for MSED 295). The Co-Director will assume tacit agreement from the faculty member unless the faculty member responds. The student registers for a 1-unit MSED 295 with the supervising UCSD faculty member or a 1-unit MSE 802 if the supervisor is at SDSU. After completing the rotation, the student sends the written reflection to the supervising faculty member who submits a grade of “satisfactory” or “unsatisfactory” at UCSD; “credit” or “no-credit” at SDSU. If the rotation is not satisfactorily completed, the co-director will help resolve any difficulties. Students cannot receive pay for working on a research rotation.

### iii. First Year Research Project: MSE 820 or MSED 298

The goal of the first year research project is to provide students with an opportunity to conduct independent (yet supervised) research in a low stakes environment. For example, it’s not desirable if the first time a doctoral student operates a video camcorder to tape an interview to be for his or her dissertation study. The project allows students to gain additional research skills, under a research apprenticeship model. The emphasis is on the doing of the research rather than the report. An important part of the project is the opportunity for students to create their own research questions. They are also usually generating the study design.
Additional details follow:

- **Data Collection**
  - Using extant data is allowed
  - If you use extant data, then greater effort on analysis is expected

- **Supervisor**
  - Select and ask a faculty member from either campus to supervise the project
  - Negotiate the research design and questions
  - Check in to get assistance on data analysis but research should be your own; this is not intended to be collaborative research such as that performed during a research assistantship on a project.
  - Submit report to the faculty member.
  - Supervisor does not have to be your RA supervisor or eventual dissertation chair

- **Report**
  - Minimum of 15 pages are required but most are longer.
  - Follow standard research study format: intro, lit review or theoretical framework, methods, findings, discussion
  - Use APA style
  - Must be single authored

- **Deadlines**
  - Shoot for completing by beginning of Fall semester
  - Must complete by end of Fall semester/quarter. No incompletes are allowed except in the case of an unforeseen, prolonged, documentable medical problem.

- **Registration**
  - Although you will complete the work in the summer, you register in fall.
  - If the supervisor is an SDSU faculty member, register for 3 units of MSE 820; If the supervising faculty member is from UCSD, register for 4 units of MSED 298

- **Human Subjects Protection (IRB)**
  - Because this is a course project you are not required to submit an IRB protocol. However, if you are using school age students as participants in your study, it is advisable to use a parental permission form and child assent form. See Joanne for a sample form.
  - When you collect data as a class project without IRB approval, then you are not able to publish that data (unless you submit an IRB for the use of extant data at a later date). Thus, if you think this project may be publishable at a later date (which is rare), then you should obtain IRB approval prior to data collection.
  - If you are collecting this data as part of your supervising faculty’s IRB-approved research, then you may need to submit a modification to cover this study.

- **Publishing**
  Once in a while, a student will submit a substantially revised version of a first year project for publication in a book or journal or to a refereed conference. If so, the revisions
should be done after the project is submitted and approved. If additional authors are
brought on, that should also occur after the project is submitted and approved.

C. Teaching Component

The MSED program balances theoretical coursework and research experiences with a required
teaching practicum. The practicum afford opportunities for practical teaching at a variety of
educational levels from elementary education through college and pre-service and in-service
education. As a result, most MSED graduates are prepared to work with prospective teachers in
addition to conducting high-quality research. One teaching practicum is required, and a second
practicum can be conducted as one of the tailored experiences. The requirements for a teaching
practicum can be fulfilled by completing any of the following experiences:

• Assisting or teaching a course for prospective teachers (MSE 805 at SDSU)
• Supervised K-12 school-based teaching (MSE 806 at SDSU; MSED 294 at UCSD)
• Specially designed internship in a non-academic setting such as a science museum, a
  software company, or a testing company (MSE 807 at SDSU).
• Teaching assistantship for an undergraduate mathematics or science course (“Content”
  500 at UCSD; e.g., Math 500 or Physics 500).

Additional features of a teaching practicum include the following:

- The experience needs be meaty enough to count as the equivalent of 3 semester units (at
  SDSU) or 4 quarter units (at UCSD). However, there are no strict rules regarding the number
  of hours to be invested. Students register for the practicum on the campus of the faculty
  supervisor for the experience.

- In general, students are not allowed to draw a salary in addition to what they earn as their
  MSED stipend for a teaching practicum. Students who TA a class for the SDSU Department
  of Mathematics and Statistics can register for MSE 805 and have this teaching experience
  count as one teaching practicum. For example, C. David Walters taught Math 210 during his
  first year in the program. He can register for MSE 805 and earn credit for it by teaching Math
  210. Students whose regular work assignment for MSED is teaching in the Mathematics
Department at UCSD can sign up for Math 500 to earn the teaching practicum. This is allowed for only one practicum. If these students want to do a second teaching practicum as a tailored experience, then it needs to be a different teaching practicum option. If a student who has an RA-ship also wants to be the teacher of record for a class like Math 210, this is possible but the student cannot “double dip,” i.e., draw a second salary. Additionally, students should not seek out, for example, a paid teaching experience in the community for the summer and expect that to count as a teaching practicum.

- As an example of a typical practicum, consider the MSE 805 experience of an MSED graduate, Ovie Soto. Ovie worked with Chris Rasmussen on the Math 414 course for preservice secondary teachers. Ovie attended most class periods for the first month or so and watched Chris teach and get to know the students. While that was happening, he designed an innovative 3 week unit on quadratic functions. Then he taught the unit on his own and graded the exam for that unit. He continued to participate once or twice more per week until the end of the semester and then did a write-up. In a second example, Charles Hohensee co-taught Math 313 with Joanne Lobato. The two met with regularly to plan, create new activities, and debrief after each class. Charles also did 50% of the teaching. That’s more than what students are required to do, but the point is that the experience is one that is negotiated between the faculty supervisor and the student.

- There does need to be some type of write-up but the nature of that report can be negotiated by the supervisor and student, and the write-up does not need to be submitted to anyone in addition to the supervisor.

- The practicum should be negotiated before the start of the semester so that the student can sign up for the course listed under that faculty member's name.

- Many students don’t complete the teaching practicum until Year 3, focusing instead on courses and the research apprenticeship strand requirements the first two years.

- One teaching practicum is required. However, if a student doesn't have much teaching experience, they can take a second one as one of their tailored experiences (with consultation from the graduate advisors).

**Course Requirements and Substitutions**

**A. Research Ethics Requirement**

All students employed by grants from the National Science Foundation or the National Institute of Health are required to complete a web-based program on Responsible Conduct of Research (RCR): see [https://nationalethicscenter.org/index.php?option=com_rctutorial](https://nationalethicscenter.org/index.php?option=com_rctutorial). To begin the web training, go to the website and complete a new user account registration form. In the last name field, enter: Last Name - RED ID number [example: Smith-123456789]—this will allow proper tracking of your training—and identify SDSU as the group affiliation. This web training will satisfy minimum RCR training requirements. The Division of Research Affairs (DRA) and the SDSU Research Foundation will be able to verify your completion of the three training modules. Failure to complete this training may jeopardize your ongoing support.
B. Course Requirement Checklist

The following checklist is provided to assist students in determining if they are on-track meeting the MSED course requirements.

<table>
<thead>
<tr>
<th>Course</th>
<th>University/ Credits</th>
<th>Date done or planned</th>
<th>Grade</th>
<th>Course Substitution?</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSE 801: Interview 8 faculty</td>
<td>SDSU, 1 credit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MSE 802 (SDSU) or MSED 295: 3 rotations</td>
<td>1 cr per rotation; at least 1 per campus</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MSE 820 (SDSU) or MSED 298 (UCSD): First year research project</td>
<td>3 cr at SDSU; 4 cr at UCSD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MSED 296A, B, &amp; C: Seminar</td>
<td>UCSD, 4 cr per class</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MthEd 603: Learning theory</td>
<td>SDSU, 3 cr</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two of MthEd 600, 601, 604, 605, 606, or 607.</td>
<td>SDSU, 3 credits each</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quantitative Methods: PSYC 201 A&amp;B or MA 282 A&amp;B. Common substitution is EDS 254/255</td>
<td>UCSD; 6 cr per class for PSYC 201; 4 cr per class for MA 282</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MSE 810: Qualitative Methods</td>
<td>SDSU, 3 cr</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Cognitive Psychology: 2 courses from UCSD (1 must be 200 level)  
  • COGS 234 or 102A - distrib cog  
  • COGS 200 - seminar  
  • COGS 260 - special topics  
  • COGS 102B - cog ethnography  
  • COGS 101A, B or C (only 1) | UCSD, 4 cr each |                      |       |                      |
| ONE Teaching Practicum:  
  o MSE 805: teaching a teacher prep class  
  o MSE 806 or MSED 294: K-12 teaching  
  o MSE 807: specially designed  
  o “Content” 500: teaching in the discipline at UCSD | MSE courses - SDSU, 3 credits | MSED 294 and Content 500 - UCSD, 4 cr |       |                      |
<table>
<thead>
<tr>
<th>Tailored experiences, choose 2 w/ advisor, from different categories</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phil/Hist.</strong> Philosophy of Science (PHIL 145); Philosophy of Biology (PHIL 146); Philosophy of Physics (PHIL 147); Seminar on Science Studies (PHIL 209A); History of Science (HISC 106, 107, 108, 109, 160/260, 163/263, 164/264, 165/265).</td>
</tr>
<tr>
<td><strong>Sociology.</strong> Sociology of Education (SocG 270); Social Organization of Education (SocC 126/EDS 126); Language, Culture, &amp; Education (SocB 117/EDS 117).</td>
</tr>
<tr>
<td><strong>Math/Sci.</strong> Grad courses in math, physics, chemistry or biology</td>
</tr>
<tr>
<td><strong>Teaching.</strong> A second, but different, practicum.</td>
</tr>
<tr>
<td><strong>Other.</strong></td>
</tr>
<tr>
<td>MSE 830: Research Seminar</td>
</tr>
</tbody>
</table>

**Total UCSD Credits (36 cr required):** ________
(max of 12 units at 100 level; lower div undergrad courses do not count)

**Total SDSU Credits (18 cr required):** ________

---

**C. Course Substitution Process**

To substitute a course for a required course, a student must first prepare a written request for the course substitution (using the Course Substitution Form that follows). The request must include a rationale for the substitution and explain how the new course fits into the student’s MSED program. The student submits the request to both SDSU and UCSD Graduate Advisors. If both advisors approve, the student submits the form to Debbie Escamilla, who will place the documentation of approval in the student’s file. Approval must be obtained before the beginning of the course.
Course Substitution Form

Student Name

Semester and Year of Change

Substitution

(course name and number)

Replacing

( course name and number)

Reason for Change:

Approved by:

SDSU Graduate Advisor’s Signature

UCSD Graduate Advisor’s Signature

Date

Date
D. Course Descriptions (prepared by MSED students)

**COGS 152: Cognitive Foundations of Math (4 units) with Postdoctoral Fellow Tyler Marghetis.** This is the undergraduate level version of this course; the graduate version is COGS 252. With the disclaimer that Núñez (the usual professor) teaches differently: this course covered several different elements of cognitive science research (historical as well as modern) in direct relationship to mathematical cognition and development. (Written by Naneh Apkarian; course taken in Spring 2014)

**COGS 200: Cognitive Science Seminar (4 units) with Professor William Bechtel.** This seminar is offered most quarters and changes topics based on the current instructor’s interest. It tends to follow a similar format: the class meets once a week for 3 hours; the first two hours involve discussions based on a few readings, and the last hour is a talk given by a visiting scholar who authored one of the readings for the week. The class tends to bring in prominent scholars in cognitive science and related fields. Because the themes for each quarter cater to a wide audience, doctoral students from a variety of departments enroll, and consequently, the conversations are truly excellent. (Written by David Quarfoot; course taken Fall 2012)

**COGS 203: Cognitive Science Foundations: Theories and Methods in the Study of Cognitive Phenomena (4 units) with Professor Seana Coulson.** This course covers a variety of theoretical and methodological approaches to the study of human cognition. The purpose of the course is to give first year cognitive science students a sense of where cognitive science has come from, what they know now, what methods they use, and where research might lead us. Topics include reasoning, categories and concepts, representations and imagery, memory, analogy and mental models, conceptual metaphor theory, and a few more recent topics. (Written by Raymond LaRochelle; course taken Fall 2014)

**COGS 220: Information Visualization (4 units) with Professor Jim Hollan.** This graduate-level seminar course covers ways in which information can be visualized through graphics. The course begins with a survey of graphical display techniques, accompanied by the affordances and obstacles of each. The coursework consists mainly of readings and responses, as well as a final project. (Written by Naneh Apkarian; course taken in Winter 2014)

**ECE 271A: Statistical Learning 1 (4 units) with Professor Nuno Vasconcelos.** This is a graduate-level course that focuses on the theoretical development and implementation of advanced ideas from machine learning (using Bayesian models). Before enrolling, students must be strong in mathematical probability, multivariable calculus, statistics, computer programming, and introductory concepts from machine learning. The class has five written problem sets which include a mix of theoretical exercises and programming tasks (which must be done in MatLab). In Fall 2013, the programming component involved training a computer to identify which pixels in an image where part of a cheetah, and which were part of the African scenery around it. As the class progressed, increasingly-sophisticated techniques were used to improve the classification accuracy. The course is mostly doctoral
students involved in programming, machine learning, and computer engineering, and is not for the faint of heart. (Written by David Quarfoot; course taken Fall 2013).

**EDS 136: Education in urban schools (6 units) with Lecturer Luz Chung.** This course counted toward a Sociology Tailored Experience. It covered a wide range of topics that teachers in public schools must face. The topics included No Child Left Behind and the effects of NCLB, issues with tracking and de-tracking, English learners, learners with disabilities, inclusion practices, LGBT and gender issues, identity and culture issues, teacher training issues, school resources, and methods for fostering engaging learning environments for a diverse classroom. The class includes tutoring for 40 hours at a low-income school in San Diego, and along with weekly readings you will interview your host teacher about the various topics, and later complete a project that helps out his/her class in some way. If you want to learn more about issues in public education (and in particular, low income public schools), then I recommend this course. You'll want to get in touch with Luz Chung at least 6 weeks in advance. It took a while for my background check and clearance to go through, and she says that's pretty normal. (Written by Raymond LaRochelle; course taken Spring 2014).

**EDS 125: Bilingual Education (4 units).** I enjoyed this course. The students were almost entirely undergraduate education majors, which meant that the course emphasized application. We covered the history of bilingual education, considered contemporary examples of successful programs, and discussed the political, social, and other implications of multilingual instruction. The course was certainly organized more like an undergraduate course with weekly in-class attendance assignments and a variety of presentations, visual pamphlet or poster projects, written work, and an emphasis on small group discussion. (Written by Katie Bjorkman)

**EDS 126: Social Organization of Education (4 units) with Professor Amy Binder.** This is an undergraduate-level lecture course which covers the social structures of education at all education levels, with an emphasis on university-level education. This course met twice a week for an hour and 20 minutes. Topics for this class includes: tracking, gender-related issues, social norms, socioeconomic issues, and school-prep and exam-prep programs. The course work consists of ten pop quizzes, a mid-term, term paper, and final exam. The exams are three essay questions. One of the texts assigned for this course is “Paying for the Party” by Armstrong and Hamilton. This book was the focus of much of the first-half of the quarter. I encourage those interested in taking the course from this instructor to read more about this text. (Written by Lauren Stewart; course taken Fall 2016).

**PHIL 145: Philosophy of Science with Professor Christian Wuthrich.** This class is mostly upper-level undergraduates with a few graduate students. It covers the historical and ethical movements in the philosophy of science. In essence, the class explores what it means to “do science” and how people should think about the notion of truth vis-à-vis scientific exploration. Beginning with Plato and Aristotle, it progresses chronologically through scholars like Hume, Newton, Popper, Lakatos, and Kuhn. The class is an excellent choice for both mathematics and science students, offering a philosophical lens to think about educational issues. (Written by David Quarfoot; course taken Fall 2013)
PSYC 201A/B: Quant Methods in Psyc I/II (6 units per course) with Professor Ed Vul.
This is a 6-unit statistics course offered by the psychology department at UCSD (the extra
credits are due to a lab section). This course covers the statistical methods used most
frequently in social science research, and so is applicable to almost all areas of research
interest. The lab section is aimed at learning to use R, an open-source programming language
and software environment for statistical computing and graphics. (Written by Naneh
Apkarian; courses taken in Fall ’13 and Winter ’14)

Registration and Course Scheduling

A. Graduate Advising

New students are assigned a pair of advisors, consisting of one Graduate Advisor from SDSU
and one Graduate Advisor from UCSD, to assist them during the first two years of the program.
Students should meet with their Graduate Advisors at SDSU and at UCSD before enrolling in
courses. A plan for the entire academic year should be prepared at the beginning of each year,
but this plan should be modified with both advisors when necessary (for example, after seeing
course schedules). Substitutions need to be approved by both advisors.

B. Planning a Course Schedule

The following information will help students schedule particular courses:

• The Seminar in Mathematics and Science Education (UCSD MSED 296ABC) is offered
  alternate years (odd year fall start – Fall 2015, 2017, etc.). Students should enroll in this
  sequence as soon as it is available.

• The Seminar in Research Design (SDSU MSE 810) is offered during alternate years (even
  year spring semester – Spring 2015, 2017, etc.). Students should enroll in this sequence as
  soon as it is available.

• The Research Seminar (SDSU MSE 830) should be taken during the fall or spring semester
  of the third year or fourth year, depending upon which semester it is being offered. It is
  offered during alternate years (e.g., Spring 2017).

• MthEd 603 (Learning Theories) is always taken Fall of Year 1 in a student’s program.

• Faculty Interviews (MSE 801) should be completed during the first semester. Some
  interviews may be conducted before the start of fall semester. Interviews may be conducted
  with other MSED students, as long as each student writes their own report of the interview.

• Research Rotations (SDSU MSE 802 and UCSD MSED 295) should be completed during
  the first year, though students can register in the fall of their Year 2 for a rotation completed
  in the summer of Year 1. Students should enroll at the campus where the research rotation is
  offered. At least one rotation must be completed at each campus. Students completing two
  rotations at SDSU can enroll in them during either the same or different semesters. Students
  completing two rotations at UCSD must enroll in both during the same quarter. Beginning in
  2016-17, one of the rotations will focus on the grant proposal process.
- The data collection and analysis for the First Year Research Project (SDSU MSE 820 or UCSD MSED 298) should be conducted during the summer following the first year. Students enroll in this course during the fall semester of the second year to complete report.

- One teaching practicum is required and is typically taken either spring of the second year or fall of the third year.

### Sample Course of Study for an MSED Math Education Student
**Admitted for Fall of an Even-Numbered Year**

**Year 1**

<table>
<thead>
<tr>
<th>SDSU</th>
<th>UCSD</th>
<th><strong>MthEd 603, Learning Theories, 3 cr</strong></th>
<th><strong>MthEd 60x (depending on what is offered – MthEd 600, 601, 604, 605, 606, or 607), 3 cr</strong></th>
<th><strong>MSE 801, Faculty interviews (Check with Joanne – may need to complete in Fall but register in Spring)</strong></th>
<th><strong>EDS 254, Quantitative methods, 4 cr</strong></th>
<th><strong>Cognitive science or tailored experience, 4 cr</strong></th>
<th><strong>MSE 802, Research Rotation, 1 cr</strong></th>
<th><strong>MSE 802, Research Rotation on Grant-Writing Process, 1 cr</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MSE 810, Qualitative Research Methods, 3 cr</strong></td>
<td><strong>A second MthEd 60x class, 3 cr</strong></td>
<td><strong>MSE 802, Research Rotation, 1 cr</strong></td>
<td><strong>Cognitive science or tailored experience, 4 cr</strong></td>
<td><strong>MSE 820, First Year Research Project, 3 cr. Collect and analyze data over summer but register and complete in Fall</strong></td>
<td><strong>MSED 296A, 4 cr</strong></td>
<td><strong>MSED 296B, 4 cr</strong></td>
<td><strong>MSED 296C, 4 cr</strong></td>
<td><strong>MSED 295, Research rotation, 1 cr</strong></td>
</tr>
</tbody>
</table>

**Year 2**

<table>
<thead>
<tr>
<th>SDSU</th>
<th>UCSD</th>
<th><strong>MSE 820, First Year Research Project, 3 cr. Collect and analyze data over summer but register and complete in Fall</strong></th>
<th><strong>Teaching practicum, e.g., MSE 805, 3 cr</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MSED 296A, 4 cr</strong></td>
<td><strong>MSED 296B, 4 cr</strong></td>
<td><strong>MSED 296C, 4 cr</strong></td>
<td></td>
</tr>
<tr>
<td><strong>EDS 255, Quantitative methods, 4 cr</strong></td>
<td><strong>Cognitive science or tailored experience, 4 cr</strong></td>
<td><strong>Cognitive science or tailored experience, 4 cr</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Year 3:** MSE 830, 3 cr, one semester at SDSU and Dissertation Research (MSE 897, 899 or MSED 299 as appropriate)

**Year 4:** Dissertation Research (MSE 897, 899 or MSED 299 as appropriate)
C. Registration

Each student is responsible for completing their registration in a timely manner throughout the program. Late fees are costly and avoidable. Registration information, including any non-MSE course schedule number, is available on-line. SDSU MSE courses have restricted schedule codes that are available from Deb Escamilla. To sign up for UCSD classes utilize the TritonLink portal. Be sure to check your auto-issued UCSD email as that campus uses only that address for all correspondence. For further UCSD course information contact the UCSD Graduate Advisor.

All students are required to register for 6 units every semester they are enrolled at SDSU (summer graduation is the exception) and at least 1 unit at UCSD (which can be MSED 299), to maintain active enrollment on that campus. Graduate students living in UCSD housing, holding various appointments or receiving financial support paid through the university or directly to them must enroll and register as full-time students each term. Full-time is defined as 12 units per quarter at UCSD and 9 units per semester at SDSU. Basically, students need to have three classes on either or both campuses combined to be considered full-time.

Summer graduation requires a few extra steps. Go on to WebPortal and cancel spring grad. Then apply for summer grad. Then (as there is no bill) via CASHnet, pay tuition and fees (just like Amazon shopping) for 1 unit of 899, keeping proof of payment for possible reimbursement.

Professional Skills Landscape

The following is an essential tool to assist MSED students in making a plan for developing the skills of a mathematics or science education researcher. This is not a checklist of requirements. Rather it identifies experiences that can help students develop important professional skills, with a focus on activities that go beyond the core course requirements.

This tool can also help students communicate with advisors and mentors regarding evolving goals. If an opportunity to develop one or more of these skills has not yet arisen, students may
wish to discuss with an advisor, supervisor, or program director ways to make them happen. Finally, the process of discussing these skills with mentors can help students develop a professional narrative.

1. Research Capacity

<table>
<thead>
<tr>
<th>Skills</th>
<th>Experiences that can Support Skill Development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scientific publishing processes</td>
<td>Publish a co-authored article with a faculty member</td>
</tr>
<tr>
<td>Analytic skills/data analysis and interpretation</td>
<td>Complete CITI human subjects research training</td>
</tr>
<tr>
<td>Responsible conduct of research</td>
<td>Complete a research ethics course or the CITI research ethics training</td>
</tr>
<tr>
<td></td>
<td>Assist in the data collection process as part of a research team</td>
</tr>
<tr>
<td></td>
<td>Help analyze data as part of a research team</td>
</tr>
<tr>
<td></td>
<td>Take part in developing Institutional Review Board (IRB) documentation as part of a research team</td>
</tr>
<tr>
<td></td>
<td>Create a research statement for your job packet</td>
</tr>
</tbody>
</table>

2. Processes for Obtaining External Funding

<table>
<thead>
<tr>
<th>Skills</th>
<th>Experiences that can Support Skill Development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grant writing process</td>
<td>Be involved with a faculty member/research team that is submitting a grant proposal</td>
</tr>
<tr>
<td>Learning about different funding agencies</td>
<td>Read examples of funded and unfunded proposals</td>
</tr>
<tr>
<td>Finding local funding sources and applying</td>
<td>Apply for travel awards at SDSU or UCSD</td>
</tr>
<tr>
<td></td>
<td>Apply for Sowder Research Award, Nicholas Branca Memorial Scholarship</td>
</tr>
<tr>
<td></td>
<td>(<a href="http://www.nicholasabrancafoundation.org/about/">http://www.nicholasabrancafoundation.org/about/</a>), and/or Spencer Dissertation Fellowship</td>
</tr>
<tr>
<td></td>
<td><a href="https://naeducation.org/naedspencer-dissertation-fellowship-program/">https://naeducation.org/naedspencer-dissertation-fellowship-program/</a></td>
</tr>
</tbody>
</table>

3. Communication Skills

<table>
<thead>
<tr>
<th>Skills</th>
<th>Experiences that can Support Skill Development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Writing/presenting for a lay audience</td>
<td>Present your work or the work of a research team at a conference</td>
</tr>
</tbody>
</table>

22
• Writing/presenting for a research audience  
• Multi-media communication and digital tools  
• Ability to give and receive constructive feedback

• Create a conference poster  
• Attend a practitioners conference (like Greater San Diego Math Council or California Science Teachers’ Association)  
• Prepare and give PowerPoint presentations  
• Attend practice proposal and dissertation talks and giving feedback  
• Present work at the SDSU Student Research Symposium

4. Leadership and Service

<table>
<thead>
<tr>
<th>Skills</th>
<th>Experiences that can Support Skill Development</th>
</tr>
</thead>
</table>
| • Organizational skills  
  • Contributing to a professional community | • Help organize a workshop  
    • Be on the graduate student committee for a faculty search  
    • Serve as the CRMSE student representative  
    • Review for a refereed journal or conference  
    • Volunteer at a local school |

5. Instructional Processes

<table>
<thead>
<tr>
<th>Skills</th>
<th>Experiences that can Support Skill Development</th>
</tr>
</thead>
</table>
| • Writing learning outcomes  
  • Developing a syllabus  
  • Creating a class lesson plan  
  • Being able to talk about issues of equity and diversity  
  • Refining pedagogical skills in inquiry  
  • Learning how to work well with teachers  
  • Understanding, unpacking, and noticing exemplary teaching practices | • Create a diversity statement for your job packet [http://facultyexcellence.ucsd.edu/c2d/]  
  • Create a teaching statement for your job packet  
  • Observe and/or co-teach a course/class session with a faculty member  
  • Visit and work with exemplary K-12 teachers’ classrooms |
Sexual Violence Prevention and Awareness Training

All new SDSU graduate students beginning in Fall 2014 are required to view a 30 minute presentation on Sexual Violence Prevention and Awareness in Blackboard. All new students will be directly notified of the video and the requirement via email and their participation will be tracked by the campus Title IX coordinator.

Residency, Time Limits, and Leaves of Absence

A. Campus Residency Requirements

Students must complete a 36-unit residency at UCSD, of which a maximum of 12 units can be upper division undergraduate courses (100 level). Lower division undergraduate courses do not count toward residency. Students must also complete an 18-unit residency at SDSU. The residency requirements cannot be replaced by coursework taken at other universities.

B. California State Residency

http://arweb.sdsu.edu/es/admissions/residency.html

Out-of-state students must be reclassified as an in-state student after the first year. As soon as possible upon arriving in San Diego students should take as many of the actions found in the list below (prepared by an MSED student) as possible. Students should file for residency during the spring semester of the first year. If not filed on time, non-resident tuition will be assessed, to be paid by the student.

Residency Reclassification Guide
Prepared by C. David Walters (2014)

So you are hoping to establish California residency for tuition purposes? Below is a list of actions you should be taking as soon as possible to give yourself the best shot at having your application for residency recategorization accepted. As far as I can tell there is no minimum list of requirements that will satisfy the Registrar’s office. However, I encourage you to take as many of the following actions as you can. From my own experience, failing to change your permanent address (as silly as that sounds) could result in a denial of your application. Part of the recategorization process is the timeliness of these actions. If you can do any of these within the first couple of weeks that you are here, that would be very good. You are supposed to be establishing residency one year before you apply for recategorization, and you’ll be applying early in the fall of your second year, which means you should try to take these actions early in the fall of your first year.

1. Change permanent address and mailing address
   - Log in to SDSU webportal: https://sunspot.sdsu.edu/pls/webapp/web_menu.login/
   - Click Graduate tab
   - Click E-Mail & Address in the list
• Click the drop down menu to select PERMANENT. Ignore the text that says “Mailing is the only mandatory type.” This is a lie. Changing your permanent address is mandatory for residency purposes, I assure you. And it is pre-populated with whichever address you used to apply to SDSU, which means it is probably an out-of-state address. Not good.
• Change your address. Click Update Account at the bottom of the page.
• Repeat this process for MAILING address.

2. **Register car.** Be sure to register your car in the state of California as soon as you possibly can. The time period for establishing residency is one year from the application deadline, **which this year is September 20**. This means you need to register your car in California before that date of your first year to ensure that when you file for reclassification in your second year that your car has been registered for more than one year in the state.

3. **Driver’s license.** Similarly, you need to have a valid California identification card, and you should obtain one before the application deadline in your first year. I assume this will be a driver’s license, but if you don’t drive you should look into obtaining some other form of ID. Perhaps this means updating your passport, or something else. In any event, make sure you do this at least one year before the application date for reclassification.

4. **Get new cell phone number.** One of the stated reasons for why my application was initially denied was that my personal phone number has an out-of-state area code. Thus, I suggest you get a new number with a California area code.

5. **Establish account with a local bank**

6. **Register to vote in CA.** You should register to vote in the state of California, and you should vote in any elections for which you are eligible. Save a copy of your voter registration form, as well as any voting stubs you get from voting in elections. Keep these as evidence of your voting rights within the state so that you can include them with your application.

7. **Seek tax counsel to determine the best method for filing your taxes in two states if you must file in your previous state of residence.** I cannot give you tax advice, but I can tell you that my wife and I had to file income taxes in two states the first year we were here, and this was a point of contention for the Registrar’s office. We did not seek counsel, and I’m
not sure if it would have helped, but if you feel that your tax situation could be a sticking point for residency reclassification you should seek professional tax counsel.

8. **Make copies of W2 forms that you file when you first begin earning income in CA**

9. **Make a copy of your mortgage/lease agreement for your place of residence**

**Forms (current as of August 2016)**

Residency information: [http://arweb.sdsu.edu/es/registrar/residency.html](http://arweb.sdsu.edu/es/registrar/residency.html)


Reclassification form: [http://arweb.sdsu.edu/es/registrar/CSU%20Reclass%20Request01-041.pdf](http://arweb.sdsu.edu/es/registrar/CSU%20Reclass%20Request01-041.pdf)

**C. Time Limits**

- Students must have advanced to candidacy (i.e., successfully completed and defended their dissertation proposal) by the end of Spring Quarter of the fourth year. This means students may not register on either campus after four years unless they have first advanced to candidacy. Students who enter in a fall term, without an intervening leave, must have advanced to candidacy before the start of the fifth fall semester at SDSU.
- Total registered time as an MSED student should not exceed six (6) years.
- The normative time for the Ph.D. in Mathematics and Science Education is 4.73 years. Students are encouraged to finish in four years if possible and the faculty supports their efforts to do so.

**D. Leave of Absence**

Permission must be formally requested to obtain a leave of absence. This process should start with the student contacting a Program Co-Director. The total amount of time a student may be on leave is limited to 3 quarters. For more details, see the UCSD OGS Academic Progress Policies & Procedures online handbook [http://grad.ucsd.edu/resources/general/academic-policies/](http://grad.ucsd.edu/resources/general/academic-policies/)

Please note a leave of absence may affect a student loan repayment.

When planning on returning from a Leave of Absence, a student must notify an MSED Co-Director of the quarter in which s/he intends to register. The Co-Director then notifies the Graduate Studies Office at each campus, who then reinstates the student. The student cannot register until this is done.

**Research Assistantships, Teaching Assistantships & Other Work**

**A. Assistantships**

Upon entrance to the program, each student is provided a research assistantship or a teaching assistantship.
**Research assistants** are assigned to work with ongoing research projects. A student should expect to spend 15-20 hours per week, 11 months per year working with the assigned project. Students are allowed to take 1 month of non-work time. For example, a student may take 1 week of vacation at Christmas, 1 week for a serious illness, 1 week during the Second Year Exam, and 1 week of vacation in the summer. Planned absences need to be negotiated with the supervisor of the assistantship. The student should not decide the specific dates (e.g., for vacation) before talking to the supervisor and taking into consideration any special needs or deadlines of the project. The stipend for these assistantships is paid in 12 monthly installments. Students can also earn one research rotation for this experience (as long as they complete the required report).

**Teaching assistants** typically teach 1 course per semester in the Department of Mathematics and Statistics at SDSU, or serve as a calculus TA (running recitation sessions) at UCSD. There may also be future opportunities for TAships at UCSD in chemistry and biology. TAs can earn teaching practicum credit for this teaching (MSED 805 at SDSU; Math 500 at UCSD). For TAs at SDSU, Susan Nickerson, an MSED faculty member in the SDSU Department of Mathematics and Statistics, provides supervision which includes, sharing pedagogical tips, resources of quizzes, tests and activities, and visiting the MSED students’ classrooms. During the summer, TAs are assigned to a research project as a research assistant.

Please note that unless you are able to work something out with State Payroll (there is a student FICA exemption), the two summer checks for SDSU TAs will reflect higher FICA withdrawals (people have reported $120/month). Also, if you work for the same department for 3+ semesters, an additional percentage will be withdrawn for mandatory retirement, etc. You will receive a letter.

**Project Placements** are made by the Steering Committee, with input from the students and from the faculty. Assignments can vary from year to year. For example, during the first year a student may have a research assistantship associated with a funded project at SDSU, but change to a teaching assistantship at UCSD the second year. In each case, the type of support will depend upon the available funding and the particular qualifications of the student. Support for the year is
identified and allocated each spring. This is a very complicated task and once assignments are made, the student is considered to have a contract with the program for the upcoming year.

**Stipends.** MSED has successfully maintained equitable funding by providing the same level of stipend support for each student in the program (e.g., the stipend is $22,000 for 2017-18). We have succeeded in fulfilling our pledge to students to provide funding for four years in the doctoral program. Students drawing paychecks from the State of California (e.g., a TA in the Dept of Mathematics and Statistics) will have their checks delivered to the department. Students on the SDSU Foundation payroll (e.g., an RA on a CRMSE project) may either pick up their checks in the SDSU Foundation payroll office or have them mailed to a specified address. Direct deposit is highly recommended.

**Vacations.** Since SDSU is on a semester system and UCSD is on a quarter system, there is variation with beginning and ending dates. Neither SDSU nor UCSD allow unexcused absences from graduate classes so it is important to stay aware of the schedules of each university. Research assistantships provide year-long support, and students are expected to work on projects 11 months each year. Vacation time should be pre-arranged with the research supervisor.

**B. Outside Employment**

To complete the degree in four years, it is in a student’s best interest to consider him- or her-self a full-time student in the summer as well as during the academic year. We consider the first year project and the second year exam to be the equivalent of taking a full load of coursework in the summers. Therefore, the program rules are such that students are not supposed to seek employment outside of holding a regular RA or TAship. On an RA-ship, students are paid over a 12 month period and are expected to work 11 months. In cases where the Steering Committee has felt there is intellectual benefit, a few students have been allowed to work on a second project for a short time (e.g., being involved in running teacher workshops) but the maximum allowable pay is 1/12 of your stipend (about $1700), and the student has to be in good standing on his/her RA or TAship. The rationale is that a student is obligated for 11 months on an RAship and if a student is willing to forgo vacation and work the last month, that is acceptable, but it still needs to go through the Steering Committee. **Consequently, if such an opportunity arises,**
contact the SDSU MSED Co-Director. Depending upon the type and placement of a student’s assistantship and the source of the additional work, there may be other rules that come into play. For example, the SDSU Research Foundation does not allow employment over 50% effort on Foundation projects (e.g., you cannot be an RA at SDSU on an externally funded grant and then pick up 2 weeks extra pay on another SDSU externally-funded grant), and the Affordable Care Act has a number of constraints regarding number of hours worked per week and total pay. Finally, students sometimes pick up a $100 here or there tutoring, which is not a concern for the program. However, teaching summer school, working on two projects all summer (which is not allowed), or working part-time outside of school are likely to hurt the student’s ability to complete the program in a timely manner and to devote adequate attention to the course work.

Fees and Financial Aid

A. “Tuition” (registration and fees)

State budget allowing, all MSED students in good academic standing and who are employed 50% time as a research assistant or a teaching assistant should receive a waiver for regular registration costs (“tuition”), through the Graduate Division. These waivers are obtained when the SDSU Program Co-Director submits a JDP7 form. Then, through a reciprocal fee arrangement with UCSD, joint doctoral students are also allowed to take courses at UCSD, without additional cost. Students who are no longer taking courses and are registering only for dissertation research units (and have not exceeded 5 years in the program), will have their registration covered by Academic Affairs. If a student enters a 6th year, he or she is responsible for paying his or her own tuition.

Mandatory campus fees at SDSU are distinct from tuition and cover such nonacademic fees as student union, health services, and library services. The current rate is $806 per semester (2016-17). Each year of Years 1-5 in a student’s program, either the grant supporting an RA or MSED will pay for one semester of mandatory campus fees. The other semester is the student’s responsibility. Students in Year 6 are responsible for these fees for both semesters.

B. Financial Aid

Some students will need further financial assistance. Financial aid is available through the Financial Aid Office at SDSU. It is recommended that the application process be started as early as possible. Although the personnel in this office try to be helpful, the combination of the federal, state, and university bureaucracies appear to triple the rules and regulations. Students’ previous year’s tax returns may be needed to verify income and eligibility. Some loans have the interest deferred with repayment beginning at the completion of a student’s program. All financial aid requests must go through the SDSU Financial Aid office, even while in residency at UCSD. For additional information, contact the SDSU Financial Aid Office http://starter.sdsu.edu/fao/
Another source for financial assistance is the California State University (CSU) Chancellor's Doctoral Incentive Program (CDIP). This program provides student loans to a limited number of individuals pursuing full-time doctoral degrees at accredited universities throughout the United States. After participants receive their doctoral degrees and obtain a qualifying instructional position in the CSU, a portion of their loan from this program will be forgiven every year. Loans of up to $10,000 per year are available up to a total of $30,000. The application form has two parts: one to be completed by the graduate student applicant, and the other by a CSU faculty advisor. So it's important to start the process early and locate a faculty member who is willing to participate. For details, see http://www.calstate.edu/hr/cdip/

**Evaluation**

**A. Annual Review**

During May of the first and second years of study, a student’s Graduate Advisors will complete the UCSD Annual Review (now online). Input can also be solicited from instructors and RA/TAship supervisors. The form is signed online by the advisors, the student, and the Program Co-Directors. There is a space for student comments on the evaluation form, if desired. This process must be completed and the forms filed with OGS on the UCSD campus by the last day of the UCSD Spring Quarter.

In the rare event that the advisors recommend that a student not continue in the program, the Steering Committee shall review all records pertaining to the student and make its own recommendation. In the event that the Steering Committee recommendation concurs with the advisors' recommendation, all documents will be forwarded to the Graduate Deans on both campuses. The Deans will then consult with one another and decide on continuance.

**B. Grades**

Students must maintain a “B” average in the program. At UCSD, if a student’s GPA drops below 3.0, the student is automatically placed on academic probation at UCSD. A student may not remain on academic probation for more than one year. At SDSU, if a student’s GPA drops below
2.8, the student is automatically place on academic probation at SDSU. The student has only one
semester to get off academic probation. Furthermore, if the student has a research assistantship or
teaching assistantship through SDSU, the student must maintain a GPA of 3.0 to continue to
receive funding.

Students are responsible for keeping their Advisors informed about their grades, particularly any
grades of B minus or below. Incompletes turn to F’s after one year at SDSU, and after one
quarter at UCSD. It is the student’s responsibility to make certain there are no errors on their
transcripts, which are available online.

Second Year Exam

A. Nature of the Exam
At the end of their second year, students take an examination that covers two areas: (1) general
cognition and (2) issues of learning pertinent to the student’s discipline (math or science). The
purpose of the second-year examination is to determine whether the student has made sufficient
progress in the program’s emphasis on cognition within a discipline to warrant continuation in
the program without remediation and reassessment.

This examination consists of two parts: (a) a written, take-home examination administered
simultaneously to all second-year students, and (b) an oral examination during which the student
will make a presentation on a research paper (or set of two shorter but closely related papers)
selected by the student’s examining committee, and then be questioned on the presentation and
its relationship to issues of general cognition. The questions for the written examination will
draw upon a common reading list given to all students by November of their second year. The
article(s) for the oral examination will be taken from the student’s area of specialization, either
mathematics education or science education.

B. Scheduling
The written examination will be sent via email to all second year students at 9 am on the first
Wednesday following July 4th. Students will send their responses to the administrator (typically
the SDSU Program Co-Director) no later than 5 pm on Friday of the same week. Students may
take the oral portion of the exam as early as 10 days after the conclusion of the written exam and
as late as the day before classes begin for the Fall Semester at SDSU.

C. Committee
In the spring of the student’s second year, the student, with input from one of the Program Co-
Directors, is responsible for initially contacting members who could serve on the student’s
second year exam committee. The student is responsible for asking one of these potential
members if he or she is willing to serve as the chair of the committee. The student will then
submit the names to one of the Co-Directors who will, in turn, submit the proposed list to the
Steering Committee, who must approve the committee members and chair.

The committee of three MSED faculty members will include one faculty member from each
campus and one member outside the student’s area of specialization (meaning mathematics
education or science education). The chair of the committee will be from the student’s area of
specialization. If the student wishes to have a non-MSED faculty member on the committee, s/he
should contact an MSED Co-Director prior to contacting the non-MSED faculty member (contact Jeff if the desired faculty is from UCSD and Joanne for SDSU). It is recommended (but not required) that one committee member have expertise in cognitive science, psychology, sociology, educational psychology, history of science or philosophy. Once the proposed committee membership has been submitted, the Steering Committee may stipulate that a fourth member is needed.

The student will be responsible for arranging meeting times and venue. The chair will be responsible for selecting oral examination articles and for ensuring that the student receives them.

D. The Written Exam
The written examination will draw from a carefully assembled group of articles called the Second Year Reading List, and will give students the opportunity to exhibit their knowledge of central issues in cognitive science in the context of specific situations drawn from their disciplines. It will consist of three questions. An MSED faculty member will create draft questions and forward them to the Steering Committee for comments. A final version of the questions will be approved by the Steering Committee.

For the past several years, the SDSU Program Co-Director has served as the test administrator. The test administrator will release the exam at 9:00 a.m. of the exam date by e-mail to all examinees. All written responses must be sent via email to the test administrator by 5 pm two days later. The test administrator will send the student’s written responses to the student’s committee members, along with copies of the student’s first and second year evaluations (see Evaluation section below).

| Students are expected to consult no one but the test administrator during the written examination. All university plagiarism policies will be enforced. |

When the written exam is emailed to students, the following set of guidelines is also sent:

1. Your goal is to write high quality essays, in terms of both substance and writing style. The essays should demonstrate your understanding of a variety of theoretical perspectives on learning and cognition, as well as central issues in mathematics and science education research.

2. While you should focus on the second-year exam reading list, it is appropriate for you to draw upon additional resources, such as readings from MSED courses, other scholarly papers, and your teaching and learning experiences.

3. The essay questions are designed to align with the reading list. However, this does not mean that you have to mention every paper on the reading list that might have bearing on the question. Support your argument by citing papers appropriately.

4. You may contact the administrator of the exam to clarify questions. However, you may not consult with anyone else during the written examination.
5. If the question asks for an opinion, then give it. Insert yourself into the essay. You will be judged on the strength of your argument, not on whether the graders agree with you.

6. There are no restrictions on length. We expect roughly 7-10 double-spaced pages including references (e.g., a 12-page essay is fine). It’s important to pace yourself and decide in advance which subset of ideas you think you can tackle well in the time available.

7. **Formatting instructions.** Type your response on a computer using Microsoft Word, following these guidelines:
   - Each response is contained within a unique file, named as LastName.QuestionNumber
   - Each file has a header with your name on the left margin, and question number and page number on the right margin (so that this information appears on every page).
   - Each file begins with a statement of the question to which the response is given.
   - Responses will be in 12 pt TimesNewRoman, double-spaced, with 1 inch margins.
   - Use clear headings (in bold font) to label each section of your essay.

E. **The Oral Exam**

The student is responsible for contacting the members of his or her committee to identify a date, time, and place for the oral examination. The student should notify the written test administrator once all committee members have agreed upon the time and place.

The committee chair will select and propose one major paper or two related papers in the student’s area of specialization to the rest of the student’s committee for their approval. This process will include adequate time for the committee to review the paper or papers and discuss any issues or concerns. The student will receive the paper or papers on July 1.

Each student should read not only the paper (or set of papers), but relevant references and other work in the area, particularly by the author, that provide background for the paper(s). Setting the paper within a general framework is helpful in understanding it. The readings for the written examination should be related to the oral examination paper(s) as appropriate. Students are encouraged to practice their oral presentations by arranging a seminar to which other students are invited. This seminar is the only consultation the student may have with other persons about the oral examination paper(s) between receiving the paper(s) and the oral examination. The student’s committee members will conduct the oral exam. [Students please note that snacks and beverages are gratefully accepted by faculty at this event.] Members of the graduate faculty may attend as observers but students are not allowed to attend. The student will be allowed 35-40 minutes to present the research paper or papers to the committee. The student will be expected to
demonstrate how the research fits into a general framework of studies within the research area; give an overview of the research including the purpose, methodology, and results; present the strengths and weaknesses of the research; and relate the paper to readings on the second year exam reading list as appropriate. A period for questions and discussion lasting 30 minutes will follow the presentation. The examination committee may question the student on the paper, the presentation, and related cognitive issues.

F. Evaluation
At the conclusion of the oral examination, the student will be asked to leave the room while the committee evaluates the student’s performance on the oral presentation and on the written examination. Evaluation criteria for both parts include the student’s ability to understand, analyze, and evaluate literature in the field, to synthesize and apply knowledge gained in coursework and assigned readings, and to organize and present research information in a logical and coherent fashion.

The student will be given a pass, a conditional pass, or a failure in each of the two parts of the exam on the Second-Year Examination form (see Appendix). A conditional pass on either exam will be accompanied by a relevant assignment, generated by the committee and designed to address the weaknesses apparent in the exam. Upon completion of the assignment, the committee will make a decision to pass or fail the student.

If the student fails an examination, then the committee will make a recommendation regarding whether the student should be allowed to retake the exam or be discontinued from the program. The committee members’ recommendation will be informed by the student’s performance on the exam, the student’s general performance in the program, and the first and second year evaluations. The Program Co-Directors, in consultation with the Steering Committee and the student’s Graduate Advisors will decide whether the student will be allowed to retake the exam or whether the student will be discontinued from the program. If a re-examination is permitted, then the exam must be retaken and passed within six months from the date of the original oral exam. A re-examination of the written test involves three new questions over the original second year reading list. A re-examination of the oral test involves the presentation of a new paper or set of two related papers. A student who fails either the written exam or the oral exam twice will be discontinued from the program.

Qualifying Exam: The Dissertation Proposal

A. Doctoral Advisor and Dissertation Committee

After successfully completing the Second-Year Examinations, the student will select a Doctoral Advisor who consents to serve in this position and replaces the Graduate Advisors. The student and Doctoral Advisor then work together to select a dissertation committee. A dissertation committee consists of at least five faculty members, including two from each campus. The “fifth tenured outside member” must be tenured at UCSD and is “outside” the content area of the chair’s department. It is the case that 3, 4 or all 5 of the members may be MSED faculty. Each doctoral committee should (but is not required to) include faculty from mathematics or mathematics education, science or science education, and cognitive science, psychology, another
social science or philosophy. In order to have a member from another university serve, permission needs to be obtained from the Dean of Graduate Studies at UCSD, and this is typically as a sixth member. At this time the JDP2 form (see Appendix) is completed and submitted. The dissertation committee must be approved by the Office of Graduate Studies at UCSD and by the Graduate Division at SDSU before the student can conduct the dissertation proposal defense (qualifying exam).

B. The Qualifying Examination

Usually during the third year (and absolutely before the end of Spring Quarter of the fourth year), a student will make an oral presentation to his/her university-approved Dissertation Committee to accompany a written proposal for the doctoral thesis. The student will be questioned on both the topic of investigation and on the proposed research methodology. Upon successful completion of this presentation, the student is recommended for advancement to candidacy for the doctoral degree. The JDP3 form is required at this event and prompt routing of same by student, including payment of a UCSD fee, is necessary to avoid registration delays.

Dissertation

After completion of the dissertation, a candidate will present a public oral defense of the doctoral thesis. An electronic copy of the dissertation must be made available to the Administrative Assistants at both campuses, four weeks before the defense, for distribution upon request to the doctoral faculty at both institutions. At the same time, the student will ensure that all committee members have electronic or paper copies of the dissertation (depending on the committee member’s preference). Copies of the abstract of the dissertation, along with the announcement of the defense, must be publicly available four weeks before the defense. [Students should provide the information to the SDSU Administrative Assistant for dissemination]. The student’s Dissertation Committee will make a recommendation to the Graduate Deans to pass or to fail the student. The JDP5 form is required at this event as well as at the final clearance appointments on both campuses. Detailed information regarding the intricate logistics of the entire exit process can be found at the OGS Current Students site http://ogs.ucsd.edu/current-students/index.html.
Thoughts on Streamlining Dissertation Writing
(prepared by David Quarfoot)

- Some students wait to send their committee the completed dissertation containing all chapters. If, instead, you send each chapter as you write it, you can get immediate feedback, corrections, additions, deletions, omissions, etc. This increases the quality of your final work and decreases the number of changes that must be made after your public defense.

- When it comes time to format your document according to the UCSD style guidelines, you will want to use Heading Styles in Word. These take 10 minutes to learn about and allow for auto-generation of your Table of Contents, List of Figures, and List of Tables that are required at the beginning of your dissertation. You can also use styles to format figure captions, table captions, and block quotes.

- If you have avoided using a citation management program during your coursework, you really should learn Zotero (or some similar tool) for your dissertation. Dissertations tend to include hundreds of references, and you are likely to cite these papers during your later career. Note that Zotero can be frustratingly slow in very large documents with hundreds of citations (i.e. your dissertation), so if you write each chapter in a separate file and then merge them, you will want to make sure your citations are nearly perfect before the join.

Instructions for Defending a Dissertation in Summer

If you need to defend your dissertation in the summer, follow these instructions:

If a fee authorization will not be utilized, UCSD will issue a reimbursement check, but you must go through the payment process, which is not intuitive.

- Cancel spring graduation if necessary and reapply for summer graduation.
- Go in to Cashnet. Look all over and find where you can choose the number of graduate level units you want – 1 (one) – from the expansion menu. Add the one unit to the basket. Pay. Keep a copy of your receipt.
- Go in to WebPortal. It will automatically default to fall, so you will need to be sure to change the session to summer. Input the schedule number Deb will give you.
- Verify you are enrolled in one (and only 1) unit of MSE 899 and you’re good!
A. Overview
Writing a dissertation is hard work, and the dual bureaucracy of a joint doctoral program doesn’t make it easier. There are like a hundred different forms and appointments and surveys and signatures and deadlines and registrations and so forth; this section is meant as a friendly guideline for helping you find all the things you need and all the information you need to use them properly. I’ve arranged the stuff in this document in roughly chronological order.
I’m making a few assumptions in this document about your timeline. The usual thing to do is to finish up in the spring or so. If you’re finishing in the fall, then adapt as necessary.

B. Documents
Here is a list of documents you will eventually need, besides things that are found in the actual text of your dissertation (and thus you can print them off whenever). The rest of this guide will explain what each one is and how you get it.

- 2 certificates of completion of Survey of Earned Doctorates (one copy for UCSD Office of Graduate Studies and one for SDSU Graduate Affairs)
- 1 certificate of completion of in-house OGS survey
- 3 copies of the signed signature page, preferably two originals (one original for UCSD Office of Graduate Studies, one original for Montezuma Publishing, one photocopy for SDSU Graduate Affairs)
- 1 (mostly) signed JDP5 (see section on final appointment)
- 1 Degree and Diploma Application
- 1 Dissertation and Thesis Release Form

C. Deadlines
- Your document needs to be in the hands of your committee four weeks before your defense date. For instance, my defense was Monday, July 14, so my dissertation was due on Monday, June 16 (and not, in particular, on June 14).
- To get a spring degree, you have to defend your dissertation before the end of the spring term at UCSD. This means that you should be done writing before mid-May.
- It has been common practice to defend in June or July, but walk in the May commencement at SDSU (or June at UCSD if you wish), and get a summer degree. (This is what I did.)
- A note from Deb: “Summer graduation, although common, will by 2015 cost almost $1000 in extra tuition. Historically, this amount has been covered by MSED, but there’s no guarantee that this practice can continue. If you can possibly defend in Spring (which means finishing writing before mid-May), by all means do so. Alternatively, be prepared to ante up some $$."
- When you schedule your defense, try to make this at least a week before your final formatting appointment (see section I).

---

1 This one doesn’t have to be original, as long as it is a good photocopy, so don’t worry if you don’t have two originals.
D. SDSU stuff
You’ll need to apply for graduation at SDSU, through the Webportal, by the first week of February. There is a $55 fee. Choose spring graduation if you’ll defend before the end of UCSD’s spring term, or summer graduation otherwise.

If you initially chose spring graduation but won’t make it, no big deal – you’ll need to cancel your spring graduation and reapply for summer graduation by the first week of May. But you do get to pay $55 again! Also you will need to enroll in 1 unit of 899 in SDSU’s summer term. (This is the thing that might cost you $1000 extra tuition.)

E. UCSD stuff
You need to make both a preliminary appointment and a final appointment with the Office of Graduate Studies (OGS). Schedule them online at https://ogs-calendar.ucsd.edu/. The earlier you can get on the schedule, the better! They check to see that your dissertation is formatted according to the formatting manual: http://ogs.ucsd.edu/_files/academic-affairs/Dissertations_Theses_Formating_Manual.pdf
(In particular, pay attention to the very helpful checklist on the last couple of pages.)

Note that you may not be able to make your final appointment until after your initial appointment has occurred. Also, you are only allowed to schedule appointments 60 days (or fewer) in advance.

F. Surveys [Note: As of Summer 2016, these surveys may no longer be required]
There are two surveys you need to complete: (a) the Survey of Earned Doctorates and (b) the in-house survey from UCSD OGS. The OGS people will send you links to both of these surveys.

Survey of Earned Doctorates:
• This is an NSF survey run out of the University of Chicago. It’ll take you like 20-30 minutes to complete. Do this one before your preliminary appointment.
• When you register, you’ll get an email with a PIN and password. Save this email.
• At the end of the survey, you get a completion certificate. Print out two copies and save it as a PDF somewhere in case you lose one. SDSU and OGS both want a copy.
• If you do end up losing a copy, you can email them your PIN to have them send you a new one. This is why you should save your PIN.

OGS survey:
• Again, 20-30 minutes. OGS will send you a link after your preliminary appointment.
• Again, there’s a certificate of completion at the end of the survey. You only need one copy of this one, but you should still save it as a PDF just for fun.

G. Preliminary appointment
I recommend you schedule this during the month between your due date and your defense. Do your best with the formatting for this appointment, but don’t feel like it has to be perfect yet. They’ll catch a few formatting errors that you’ll need to fix before your final appointment.
Upload a PDF of your entire dissertation to [http://www.etdadmin.com](http://www.etdadmin.com) the day before your appointment.

Things you need to bring:

- A paper copy of everything before page 1.
- One certificate from completing the Survey of Earned Doctorates.

This meeting takes about 20-30 minutes. Sara Hogue will go through each page of the dissertation on the computer screen (~ 1 page/second) and look for formatting errors. The most common errors include: improper margins, not putting the page numbers for the start of chapters at the bottom, and not single-spacing block quotes (which must be indented from both sides).

**H. Defense**

Things you need to bring for your committee to sign:

- Three copies of your signature page and a pen with dark ink.
- A copy of your JDP5. Deb will send you a blank one. Some of the Graduate Advisors might be at your defense; see the next section for who these people are, and if they’re there, get their signatures to save yourself a trip.

**I. Final appointment**

This needs to be scheduled after your defense and before the Friday of finals week of the quarter you plan to graduate at UCSD (check with the Office of Graduate Studies to make sure of the exact date). Give yourself at least a week, in case you need to make some changes to your text. Submit your dissertation online the day before: [http://www.etdadmin.com](http://www.etdadmin.com). This time all the formatting does need to be right. Check your email an hour before your appointment, because Sara Hogue has probably sent you an email with a few minor fixes. If you schedule your appointment around 11 AM, you will have time to make these changes before you go to your meeting, leaving you time to take care of things at SDSU later in the day.

Things you need to bring:

- **JDP5** – There are lots of signature lines on this thing. Let’s talk about which ones you need to obtain and who can sign on them:
  - Clearly you need your committee’s signatures. Get these at your defense.
  - You also need signatures from the Graduate Advisors at SDSU and UCSD.
  - The Graduate Advisor at SDSU is Joanne Lobato. If she is unavailable, ask Deb Escamilla who should sign.
  - The Graduate Advisor at UCSD can be either Jeff Rabin or Gabriele Weinhausen.
  - You don’t need to worry about the Deans at UCSD or SDSU, or the Graduate Division Office or the Librarian or whatever. Your JDP5 will be circulated by these people after your final appointment to get those ones.
- An original (not a photocopy) of your signed signature page.
- Your certificate from completing the OGS survey.
- Three copies of your abstract and I think a copy of your title page.
Sara Hogue will sign your JDP5 for the UCSD dean, and now you take it to SDSU.

J. One more trip to SDSU
Email Rita Baumann in the SDSU Graduate Affairs Office (rbaumann@mail.sdsu.edu) a day or so before to make sure she’s around when you’ll be around. This needs to be after your final appointment at UCSD, because you need Sara’s signature on your JDP5. If you have the required paperwork, this meeting takes about 5 minutes. Things to bring:
- Two copies of your signature page (one original², one photocopy)
- The JDP5, now signed by Sara Hogue
- A copy of your SED completion certificate
- A copy of your title page

Rita will take the photocopy of your signature page, and will give you a photocopy of your JDP5 (for your records) and two new forms to take to Montezuma Publishing, which is your next stop. Things to bring Montezuma Publishing:
- The original* signature page you brought along
- Dissertation Clearance Sheet (Rita just gave this to you)
- A form about embargoing (Rita just gave this to you as well)
- A PDF version of your dissertation on a portable thumb drive
- $45, because of course you get to pay more money at this point

K. Diploma
In 3-4 weeks you’ll get a letter from the UCSD dean saying you’ve completed everything. You can give this to your new department at your new job to show them you’re legit. (You won’t get your actual diploma for several months.) You’re done, yay! Congratulations and now you never have to do this again!

Other Helpful Information
- Health Services

Use the Calpulli Center at SDSU! It is not just for undergrads. The staff is very qualified and very professional and in addition to everyday care, specialty services including dentistry and optometry are available at low cost. Students pay a mandatory fee for these services each semester. Note that health insurance is not covered in these fees, but with the Affordable Care Act, high quality and affordable insurance is available (see Deb Escamilla for information). The MSED program will work hard to locate funding to pay for your medical insurance (in Years 1-4) although we cannot guarantee this coverage.

² Or not, as noted earlier.
More information about the SDSU Student Health Services (written by Bridget Druken):

Fellow MSED graduate students, I recommend learning more about SDSU's Student Health Services (http://shs.sdsu.edu/) and taking advantage of what they have to offer. To help give you a sense of what there is, I present an infomercial-inspired listing.

Do you feel like learning about meditation? The Counseling and Psychological Services (CAPS) center offers a free course on meditation guided by Dr. Linda Smith and a graduate student working at CAPS. It meets weekly with other students at SDSU for around 10-12 weeks each semester.

Do you feel like talking to an unbiased and talented professional about issues you are grappling with? Health Services also offer free counseling at CAPS to assist you in challenging times and help you grow.

Do you feel like learning more about family planning services? Student Health Services can assist you in signing up for Family PACT, which is free family planning services for men and women on birth control, condoms, safe sex supplies and more.

Do you feel like sitting in a huge, quiet egg chair? Anyone is invited to go to the CAPS center, sit and relax between classes.

Do you feel like engaging in physical activities to add balance to your cerebral lifestyle? The Aztec Recreational Center (ARC) (http://arc.sdsu.edu/) provides a range of lovely ways to do that, including: cardio machines; a weight room; a range of amazing group fitness classes that include many different styles of yoga, pilates, zumba and spin classes; rec classes; credit classes; Aztec Adventures; wellness programs; sports club; Mission Bay Aquadic Center; tennis courts; a climbing wall; bowling... whew, it's a long list! The ARC offers a one-week free pass to check out all that it has to offer.

Do you feel like swimming/diving/lounging/hot-tubbing in an outdoor pool? The Aquaplex (http://arc.sdsu.edu/aquaplex/), which comes included in an ARC membership (but can be purchased without an ARC membership as well), gives you access to two large outdoor solar-heated pools, a spa and full-service locker rooms.

I have enjoyed participating in many of the above and appreciate these opportunities for an all-around education of the body. In the words of Vietnamese Zen Buddhist monk Thict Nhat Hanh, "Peace is every step." So start stepping!

UCSD:  http://studenthealth.ucsd.edu/. Services are available to joint doctoral students, but at a regular fee for service cost, unless tuition has been paid at UCSD (which is typically not the case for MSED students).
• **Housing**

**SDSU Housing.** [http://newscenter.sdsu.edu/housing/Default.aspx](http://newscenter.sdsu.edu/housing/Default.aspx). Limited grad student housing options are available at SDSU.

**UCSD Housing.** [http://hdh.ucsd.edu/arch/gradhousing.asp](http://hdh.ucsd.edu/arch/gradhousing.asp). UCSD offers a variety of graduate student housing. A student must be admitted before an application for housing will be processed and proof of admission or a current ID card is required upon issuance of a lease. If claiming married or family status, which is priority standing, proof is required. This is a very affordable and desirable option for many. Apply as early as possible!

**Other.** Rental properties are listed with Craigslist and The Reader. Check with current students for advice on neighborhoods and information on current options.

• **What is available at CRMSE?**

**Clerical Assistance.** CRMSE usually has a student assistant who works part time. If cleared by the Administrative Coordinator, Karen Foehl Palmer, you are welcome to ask for help, for example, with photocopying.

**Technical Assistance.** Requests for computer/technical assistance go through Karen.

**CRMSE Directory.** This is an in-house publication made available via email. Ask for a copy!

**Outgoing Mail.** All MSED students have mailboxes in the doctoral student office, Suite 236. MSED faculty have mailboxes in the CRMSE kitchen. Campus mail should go in the appropriate bin on top of the mailboxes in the CRMSE kitchen. There is a USPS mailbox conveniently located in front of the main Alvarado building, convenience stamps available for purchase in the student office. Our USPS address is: CRMSE, 6475 Alvarado Road, Suite 206, San Diego, CA. 92120-5013. The CRMSE campus mail code is MC 1862.

**Office Supplies.** Office supplies (post-it notes, pens, etc.) for doctoral students are available in the Doctoral Student Office. A request form is also posted.

**Copier, Fax, and other Office Devices.** CRMSE has a copier with excellent capabilities including PDF. Ask Karen for a personal copy code. Currently, copies are 3 cents per page for doctoral students, with invoices issued every quarter (sorry, no cash payment even for small amounts; not our choice, Foundation rules). CRMSE fax number is 619-594-1581.
**MSED Equipment:** Several digital video camcorders, tripods, PZM microphones, and headphones are available for data collection. These are kept in the cabinets above the couch in the doctoral student suite, Suite 236.

**CRMSE Equipment:** Digital still and video cameras, projector, laptop and other pieces of office and presentation equipment are available for loan – see the inventory list inside the Supplies Room in 206. Advance reservations may be made. All must be signed out. (The equipment is not insured; individuals are responsible for any loss or damage.)

**Kitchens.** Please keep them tidy. Wash, dry and put away your own dishes. Food left on the counter in the MSED office and in the CRMSE kitchen is assumed to be for sharing. Inside the fridge, unlabeled food belongs to someone. We actively encourage recycling!

**Security.** Call 911 from any internal phone to be connected to campus police. This is a publicly-accessible building. Please keep suite doors closed and locked. Internal doors may be left unlocked, no problem.

**Facilities.** Ask Deb or Karen to call Facilities to report blocked toilets etc. If they’re not here, in an emergency call 45761 from any internal phone.

**Phones.** You can use the phones for outgoing campus and local calls and for incoming calls. For campus numbers, dial the last 5 digits. For off-campus local calls, press 8 for an outside line.

- **Library Use**
  - SDSU Love Library: [http://infodome.sdsu.edu/](http://infodome.sdsu.edu/)
  - UCSD: [http://libraries.ucsd.edu/](http://libraries.ucsd.edu/)
  - A student’s current photo ID entitles them to a card and full library privileges.
  - The **Sowder Library**, donated by professors emeritus Judy and Larry Sowder, is housed in the Doctoral Student Suite at CRMSE. This collection of texts in mathematics and science education research provides a valuable resource for MSED students and CRMSE members.
• **Aztec Shops**

Aztec Shops on the SDSU campus offers deep discounts on some software, for example, 2016 Microsoft Word for $16 when you swipe your Red ID.

• **Campus Maps & Parking**

  
  - UCSD offers a free Triton Link bus pass that can be used on ANY San Diego bus or trolley.
  
  - Students who join the UCSD Bike Club are eligible for a free booklet of 10 day passes.
  
  - UCSD parking is free at meters on university holidays, weekends, and from 11 pm to 7 am weekdays.
  
  - Anyone with a valid SDSU parking pass is eligible to receive a free booklet of 10 day passes from UCSD (for student parking spaces). Simply take the valid SDSU pass to the UCSD Gilman Parking Pavilion where your name will be cross checked on their list.
  
  - New for 2016-17: MSED is purchasing 10 UCSD parking permits (for valuable green B spaces) per quarter for each Year 1-2 student. A few permits will also be available for Year 3+ students.

• **How to Get to UCSD - Prepared by Katie Bjorkman**

**Drive.** A good option at certain times of day. The drive itself is under 30 minutes if there is no traffic. There will be fairly heavy traffic going SDSU to UCSD from 7-10 am and UCSD to SDSU from 3-6pm which makes it closer to an hour driving + parking time.

Parking can be difficult at UCSD even with a parking pass. At SDSU, you can always park at CRMSE without a parking pass. Off-campus at UCSD, my best luck has been on Lebon Dr just south of Nobel. You can then catch the “superloop” 201/202 bus at either end of the block to get to campus (202 to campus, 201 back). Note that the bus runs every ~7 minutes but is sometimes full/can’t take on more passengers so leave enough wiggle room to wait 15 minutes. The campus shuttle also stops on the north end of the block.

I have also been told that there is free parking within walking distance to the north part of campus at the Torrey Pines gliderport, but I have never parked there and I am not sure if there are time or other restrictions. There is also street parking a few places in La Jolla, but the businesses that say “no UCSD parking” mean it, so be careful!
**Public transit.** Transit is great for those of us who like to save on gas and/or save the planet. The Green Line trolley can be caught a block from CRMSE or on campus at SDSU. Take it toward 12th St/Imperial, it runs every 15 minutes during the day.

From there you can get off at Fashion Valley and catch the 41 bus (non-express) every 15 minutes during the day or continue two additional stops to Old Town and catch the 150 bus (express) every 30 minutes during the day – both buses run more often during peak hours and both take you to UCSD. I leave about an hour and half (either direction) for the transit as sometimes the trolley gets in just as the bus is leaving or vice versa. Whether the express bus that runs less often and is caught two stops farther is faster or not is a function of time of time and how well the bus/trolley schedules coincide at that stop.

The 30 bus is best avoided… it technically runs from Old Town to UCSD, but makes an excessive number of stops in Pacific Beach. It is usually faster to wait 30 minutes for the next 150 bus. There is also a shuttle that runs from UCSD to Old Town to Hillcrest Medical Center that is free for UCSD students. Pay attention to which way the “loop” is running to avoid an exceptionally longer than planned commute! Find the current schedule on the UCSD website.
Travel and Research Awards

1. **Sowder Research Award**

The Judy and Larry Sowder Research Award offers MSED students up to $1000 to support their research program and professional growth. The award may be used for activities such as a research presentation at a national conference, software or hardware to support progress on the dissertation, stipends for interview participants, and other research activities that contribute to the applicant’s professional growth as a mathematics and science education researcher. Applications will be reviewed by the MSED Steering Committee and up to three awards per academic year will be approved. Each student may receive at most one award during their tenure as a graduate student in the MSED program. **Proposal due dates:** October 15 and February 15. See Deb for application.

2. **SDSU Travel Funds**

- **Graduate Student Travel Fund.** This funds supports travel associated with scholarly research and creative activities. [http://aztecgrad.sdsu.edu/researchaffairs/gstf.aspx](http://aztecgrad.sdsu.edu/researchaffairs/gstf.aspx)
  The maximum award is $1,000. The funds must be used within the cycle months. Awards for the Fall Cycle must be used within October 1, 2016- January 31, 2017. The Graduate Student Travel Fund is available to all degree-seeking SDSU graduate students with an accumulated grade point average of at least 3.0. To apply for the 2016 Fall Cycle, applications must be turned in no later than **October 1, 2016**.

- **College of Science Instructionally Related Activities (IRA) Travel Funds.** The College of Sciences receives Instructionally Related Activities (IRA) funds to help support student travel to professional meetings to present the results of their research. In order, to apply for IRA funds, the student must be enrolled in a College of Sciences undergraduate or graduate program. Applications will be considered two times during the academic year, the deadlines are as follows: **November 1** is the deadline for Fall semester travel (July 1- Dec. 31) and **April 1** is the deadline for Spring semester travel (Jan. 1- June 30). In the past the awards have ranged from $50-$150 for in-state travel, $200-$350 for out-of-state travel and $400-500 for international travel. See Deb for an application (which requires multiple forms)


4. **Nicholas A. Branca Scholarship.** Every year, two $3,000 scholarships are award to honor Dr. Branca’s memory and work in mathematics education. Applications are due **June 1**. See [http://www.nicholasabrancafoundation.org/](http://www.nicholasabrancafoundation.org/)

Appendix: JDP Forms

It is the student's responsibility that the following forms are completed and in a timely manner. Originals, not copies, are required. Regarding signatures, each form proceeds in order down the page, requiring many inter, and often intra-campus stops. The deans will not sign until everything else has been properly filled out; any fees paid, dissertation copies submitted, etc. Allow sufficient time for this entire back and forth process to occur. Completed copies of all forms will reside in the student’s files on each campus.

JDP-1: Notice of Admission

This form is signed shortly after a student’s acceptance to the program, indicating intent to enroll in the program.

JDP-2: Nomination for Qualifying Examination

This form is used for the nomination of the dissertation committee. It must be approved and signed by the student’s chair and the current UCSD representative as well as both graduate division deans. Committee signatures are not required on this form, however, the committee must be approved by the campus deans before the defense of the dissertation proposal.

JDP-3: Advancement to Candidacy

This form is required at the defense of the dissertation proposal. It requires signatures from the entire committee. Each member must mark a yes or no on approval. Once this form has been completely processed, with fees paid, all signatures obtained, etc., a letter from UCSD will be mailed showing advancement to candidacy status. The letter will be accompanied by a copy of the completed JDP-3 and a book with formatting rules for the dissertation.

JDP-4: Change in Dissertation Committee Membership

This form is to be used only if there is a change in committee and the JDP-2 has already been approved. It is not permissible to simply add a name or substitute someone on the original JDP-2, the entire approval process must be gone through a second time using this alternate form.

JDP-5: Approval for Doctoral Degree

This is the form taken to the final defense of the dissertation. Again, all members of the committee must sign and indicate a decision on approval. This form has to accompany the final copies of the dissertation when they are turned in as it needs to be signed off on by the various departments at both universities.

Second Year Exam Form

This is an internal MSED form that is used to record the outcome of the second year exam.
# Notice of Admission to a Doctor of Philosophy Degree Program

## Recommendation
After due deliberation, the cooperating faculty of the two institutions recommend for admission:

<table>
<thead>
<tr>
<th>Student Name:</th>
<th>MSED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Last</td>
<td>First</td>
</tr>
</tbody>
</table>

Beginning:  
- Fall _√_  
- Winter ___  
- Spring ___  
term of 20_

This student will enroll during the first term of attendance at:  
- SDSU only ___  
- UCSD only ___  
- both campuses _√_

The first term this student will enroll at UCSD is:  
- Fall _√_  
- Winter ___  
- Spring ___ 200_

SDSU Faculty Adviser  
UCSD Faculty Adviser

Recommended:  
SDSU Program Director (signature)  
UCSD Group Chair (signature)

## Approval
Upon recommendation of the participating departments at SDSU and UCSD, the above named student has been formally accepted for admission to the joint doctoral program in Mathematics and Science Education.

Dean, Graduate Division and Research, SDSU  
Dean, Office of Graduate Studies and Research, UCSD

## Applicant Notification
You have been admitted to San Diego State University with classified graduate standing and the University of California, San Diego with graduate standing. If you intend to enter the joint doctoral program at these institutions in the term specified, complete the following information and sign.

Local Address:  
No. and Street  
City  
State  
Zip  
Local Telephone

Permanent Address:  
No. and Street  
City  
State  
Zip  
Telephone

Student’s Signature  
Date

**RETURN THIS NOTICE BY __________________ TO:**

Univ. Calif, San Diego – Graduate Admissions  
9500 Gilman Dr., 516 University Center  
La Jolla, CA  92093-0086

48
Joint Doctoral Program
NOMINATION OF THE DOCTORAL COMMITTEE FOR QUALIFYING EXAMINATIONS
FOR THE DEGREE OF DOCTOR OF PHILOSOPHY IN
MATHEMATICS AND SCIENCE EDUCATION

Name

Last First Middle RedID UCSD Student#

Address

Number and Street City State Zip Telephone

To:  Dean, Graduate Studies and Research, UCSD / Dean, Graduate Division and Research, SDSU

In the opinion of the Group of MSED at our respective institutions, the student named is ready to proceed to the Qualifying Examinations for the degree of Doctor of Philosophy. The proposed field of study is: Mathematics and Science Education.

The following persons, who have agreed to serve, are nominated as the Joint Doctoral Committee for the Qualifying Examinations:

<table>
<thead>
<tr>
<th>Name and Academic Title</th>
<th>Department</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chair</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Co-Chair (if applicable)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Approved SDSU: Approved UCSD:

Graduate Adviser Dept./Group Chair

Date_________________________ Date_________________________

Dean, Graduate Division and Research, SDSU  Dean, Graduate Studies and Research, UCSD

Date_________________________ Date_________________________

------------------------------------------------------------------------------------------------------------------------------------------------------------------
Joint Doctoral Program
REPORT OF THE QUALIFYING EXAMINATION AND ADVANCEMENT TO CANDIDACY
FOR THE DEGREE OF DOCTOR OF PHILOSOPHY IN
MATHEMATICS AND SCIENCE EDUCATION

Name

Last        First        Middle        RedID        UCSD Student#  

Address

Number and Street        City        State        Zip        Telephone

To:  Dean, Graduate Studies and Research, UCSD / Dean, Graduate Division and Research, SDSU

The members of the Joint Doctoral Committee for the Qualifying Examination report that the candidate has completed all pre-dissertation requirements in the major and taken the qualifying examination on (date):

<table>
<thead>
<tr>
<th>Committee Member</th>
<th>Signature</th>
<th>Institution</th>
<th>Approval of Qualifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chair</td>
<td></td>
<td></td>
<td>__Yes __No</td>
</tr>
<tr>
<td>Co-Chair (if applicable)</td>
<td></td>
<td></td>
<td>__Yes __No</td>
</tr>
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<td>__Yes __No</td>
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<td>__Yes __No</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>__Yes __No</td>
</tr>
</tbody>
</table>

The committee recommends advancement to candidacy for the degree of Doctor of Philosophy in Mathematics and Science Education

Approved SDSU:  Approved UCSD:

Graduate Adviser

Date

Group Chair

Date

The candidacy fee has been paid.

__________________
validated by UCSD Cashier

Date

I request advancement to candidacy. I plan to complete my dissertation by: ____________

Date

__________________
Signature

Date Signed

Advancement to candidacy approved:

Dean, Graduate Division and Research, SDSU

Date

Dean, Graduate Studies and Research, UCSD

Date
Joint Doctoral Program

NOMINATION OF THE DOCTORAL DISSERTATION COMMITTEE
FOR THE DEGREE OF DOCTOR OF PHILOSOPHY IN
MATHEMATICS AND SCIENCE EDUCATION

Name ____________________________

Address __________________________

Number and Street City State Zip Telephone

To: Dean, Graduate Studies and Research, UCSD / Dean, Graduate Division and Research, SDSU

The student named has established eligibility for the nomination of a dissertation committee.

Proposed title of dissertation: _______________________________________________________

The following persons, who have agreed to serve, are nominated as the Doctoral Committee:

<table>
<thead>
<tr>
<th>Name and Academic Title</th>
<th>Department</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chair</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Co-Chair (if applicable)</td>
<td></td>
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</tr>
</tbody>
</table>

Approved SDSU: __________________________

Approved UCSD: __________________________

Graduate Adviser __________________________

Dept./Group Chair __________________________

Date __________________________ Date __________________________

Dean, Graduate Division and Research, SDSU __________________________

Dean, Graduate Studies and Research, UCSD __________________________

Date __________________________ Date __________________________

---------------------------------------------------------------------------------------------------------------------
Joint Doctoral Program

REPORT OF THE FINAL EXAMINATION AND FILING OF THE DISSERTATION
FOR THE DEGREE OF DOCTOR OF PHILOSOPHY IN
MATHEMATICS AND SCIENCE EDUCATION

Name

Last First Middle RedID UCSD Student#
Print name as it is to appear on the diploma ____________________________

Address
Number and Street City State Zip Telephone ____________________________

To: Dean, Graduate Studies and Research, UCSD / Dean, Graduate Division and Research, SDSU

The members of the Doctoral Committee report on the candidate’s final examination:

Committee Member Signature Approved for Degree
Chair ____________________________ ____________________________ __Yes __No
Co-Chair (if applicable) ____________________________ ____________________________ __Yes __No

The final examination and dissertation are __ unanimously __ not unanimously approved, and the candidate is __ recommended __ not recommended for the award of the degree of Doctor of Philosophy in Mathematics and Science Education in the Group of Mathematics and Science Education as of (date) ________________________________
Dissertation Title: ________________________________

Graduate Adviser Group Chair
Date Date ____________________________

The candidate has fulfilled all academic and registration requirements with the exception of depositing the dissertation with the Library and SDSU
Date ____________ Dean, Graduate Studies and Research, UCSD ____________________________

Dissertation accepted for deposit.

Graduate Division Office, SDSU Librarian, UCSD

Conferral of the degree is recommended as of ________________________________
(month, day, year)

Dean, Graduate Division and Research, SDSU Dean, Graduate Studies and Research, UCSD
Date Date ____________

______________________________
MSED Second-Year Examination

Student’s Name________________________________________________________

The committee members have examined the above student in the disciplinary area of
_____________________________________________________________________

On the **ORAL** portion of this examination, we agree that the student receive a

PASS  CONDITIONAL PASS  FAIL

In the case of a conditional pass, the following are conditions for PASS (may be attached):

Faculty Responsible ______________________ Due Date________

On the **WRITTEN** portion of this examination, we agree that the student receive a

PASS  CONDITIONAL PASS  FAIL

In the case of a conditional pass, the following are conditions for PASS (may be attached):

Faculty Responsible ______________________ Due Date________

This is the student’s first _____ second _____ attempt at the Second-year Examinations.
(Note: Students who fail either portion of the examination will be permitted to retake the entire examination once and within 6 months of the date of the first attempt.)

Signatures of committee members: (printed names)

__________________________________________  __________________________
Chair

__________________________________________  __________________________
__________________________________________  __________________________
__________________________________________  __________________________
__________________________________________  __________________________

Date:______________________________