

2021-2022 Guide to the Global Disease Biology (GDB) Practicum

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1. Who is this guide for?

This '**Guide to the GDB Practicum**' (or 'Guide') is primarily written for students majoring in Global Disease Biology (GDB). It may also be helpful for faculty who are considering to become a **Practicum Mentor** for one or more students in the GDB major. The Guide contains a lot of important information, so read it carefully and in its entirety. It is updated every academic year, so make sure you are reading the most current version.

2. What is the GDB Practicum?

The **GDB Practicum** is a 1- or 2-quarter research experience that allows GDB majors to benefit from working closely with (typically) a UC Davis faculty member on a topic that is related in the broadest sense to health and disease. This faculty member officially serves as the student's **Practicum Mentor**. The idea behind the Practicum is to experientially learn how to apply the scientific method to a question that is defined and refined by the student-mentor pair. This question then gets answered by the student, with guidance from the mentor, through experimentation, data crunching, surveys, or a focused synthesis of the scientific literature. A key deliverable of the practicum is a report in which the student details, analyzes and interprets their findings in the format of a scientific manuscript. Typically, this so-called **Practicum Report** is between 10 and 20 pages in length, but may be longer, commensurate with the topic and with the 1- or 2-quarter duration of the Practicum.

3. How does the GDB Practicum work?

The **GDB Practicum** consists of two parts: **GDB 189** and **GDB 189D** (each explained below). The first part, **GDB 189**, is listed in the UC Davis catalog as a 3-unit course entitled 'Global Disease Biology Senior Research' and is appropriately referred to as the 'capstone research experience for the GDB major'. Typically, the **GDB 189 Instructor of Record** is the UC Davis faculty member who also serves as the student's **Practicum Mentor**. On rare occasions, the **GDB 189 Instructor of Record** and **Practicum Mentor** are not the same person, for example when the Practicum mentor is not affiliated with UC Davis (more on this exception in section 6 of this Guide).

The 3 units of credit for **GDB 189** represent a commitment of 9 hours per week. This means that students enrolled in **GDB 189** are expected to invest at least that amount of time on research (i.e. lab work, data analysis, or searching the literature), in consultation with their **Practicum Mentor** for a

minimum of 90 hours per quarter (9 hours per week, 10 weeks per quarter). Oftentimes, much of the day-to-day interactions of the GDB student on their practicum project will be with one or more individuals (graduate students, postdocs) in the research group/lab of their Practicum Mentor.

GDB 189 may be repeated once for another 3 units of credit in a subsequent quarter. Beyond that, additional hours and quarters may be spent by the student on the practicum project, but that additional time cannot be claimed as GDB 189 units. Such time may be counted as 192, 195 or 199 units, at the discretion of the **Practicum Mentor**. You will need to contact the appropriate department office to receive the variable unit petition form. (For ABI, ENT, NEM, PLP, and SAS variable unit courses, please contact gdb-advise@ucdavis.edu).

Students are graded for their performance in **GDB 189** by their **GDB 189 Instructor of Record** (i.e. their Practicum Mentor, in most cases). Grading is on a Pass/Not Pass basis, following an overall assessment of whether the student has satisfactorily engaged with the **Practicum Mentor** and/or with members of their research group/lab in formulating and testing a research question, having spent a minimum of 9 hours per week on the project, and having generated, collected and analyzed a sufficient body of data to generate an outline or draft for the deliverable of the practicum experience, which is the **Practicum Report**.

GDB 189D is the second part of the GDB Practicum, and this is when the student will complete and submit the **Practicum Report**. Listed in the catalog as 'Global Disease Biology Research Discussion', this 'class' may be taken in the same quarter as **GDB 189**, although we recommend taking GDB 189 and GDB 189D sequentially, especially if the student takes only one quarter of GDB 189. The **Practicum Report** is written under the guidance of the **Practicum Mentor** and/or **GDB 189 Instructor of Record**. Enrollment in **GDB 189D** earns students 1 unit of credit for the 3 hours that they spend each week on writing their **Practicum Report**.

Students enrolled in **GDB 189D** convene as a group with the **GDB 189D Instructor of Record** (GDB Lead Faculty Advisor, Professor Johan Leveau) once at the start of the quarter for a mandatory orientation meeting, after which there are regular office hours for students to visit and discuss with the instructor and other students the progress of writing their practicum report.

The **GDB 189D Instructor of Record** grades **GDB 189D** Pass/Not Pass, based on the complete and timely submission of the **Practicum Report**, together with a cover sheet signed and dated by the student and the **Practicum Mentor** and/or **GDB 189 Instructor of Record**. These signatures on the cover sheet indicate that the **Practicum Mentor and/or GDB 189 Instructor of Record** guided the student in producing the report, that they read it, and approve of its content.

4. What is the GDB Practicum not?

The **GDB Practicum** is not a '190-199' variable-unit internship or special study class as part of which you perform experiments with the purpose to allow you to list 'lab experience' on your resume rather than to learn how to explain in word and writing why and in what larger context those experiments were done and what their outcomes mean. It also is not a literature review without a carefully defined

question that you as a student put together independently and that a faculty member gets to read and grade once you submit it to them.

To reiterate what was said already, the **GDB Practicum** allows students to take full advantage of access to and commitment from a UC Davis faculty member to help familiarize and train them in one or more elements of the scientific method in the context of a specific expertise: how to formulate a hypothesis or a research question, how to design and perform an experiment or focused mining of the scientific literature, how to analyze and interpret the data, and how to communicate your findings. These are important skills, and are most effectively acquired by establishing a good working relationship with your mentor which is based on regular discussions and may involve re-thinking, re-analyzing and re-writing in response to feedback from your mentor.

*Also consider this: your **Practicum Mentor** is probably the most qualified person to write you a letter of reference for your time as GDB student here at UC Davis: they will have had ample time and opportunity to observe and evaluate your work ethic, enthusiasm and ambitions, and therefore can write letters that have much more meaningful content and added value for future employers or admissions committees than for example letters from professors who you took a class with once.*

5. How do I find a Practicum Mentor?

The most important piece of advice for finding a **Practicum Mentor** is to start looking for one as soon as possible. Keep in mind that finding a **Practicum Mentor** is not the same as looking for one. Finding a Practicum Mentor means that you met at least once with a UC Davis faculty member and discussed shared research interests, possible project topics, and expectations. Also, the faculty member will have to agree to serve as your **Practicum Mentor**. It takes time and effort on the student's behalf to get to that point, and it is crucial not to underestimate this time and effort. We encourage students to have identified a **Practicum Mentor** by the Spring quarter of their junior year at the latest (sooner is recommended).

As a GDB student, you will be taking the 3-unit course **GDB 187** (listed as 'Global Disease Biology Seminar' in the UC Davis catalog) sometime in your 3rd/junior year. GDB 187 will help to prepare you for the practicum, in particular GDB 189 and 189D, but you are encouraged to start looking for a practicum mentor before you take GDB 187D. If you have already identified a mentor before starting GDB 187, some aspects of the course will be a lot easier!

Here are some tips and strategies to search for a potential **Practicum Mentor**:

- a) *Connect with previous/current instructors.* Maybe there is a class you really liked... connect with the instructor during office hours or by email to inquire about research opportunities in their lab. They may also know of other research opportunities on campus.
- b) *Emails from the GDB Advising Office or other campus departments* (i.e. Internship & Career Center) often have information about opportunities for undergraduate students.
- c) *Explore UC Davis department websites* for faculty and research topics that appeal to you. Contact these potential **Practicum Mentors** by e-mail. Explain to them what the **GDB Practicum** is (pitch it as a unique opportunity for you, as the student, and for them as the mentor; do not sell it as a

graduation requirement that you need their signature on). Explain what your goals are for the Practicum and what their responsibilities are as **Practicum Mentors**; share with them a copy of this **Guide to the GDB Practicum**. For assistance with professional correspondence and formatting emails to faculty, visit the UCD Internship and Career Center (ICC).

- d) *Be prepared to not always receive a reply* and sometimes receive unfavorable replies (e.g. 'sorry, not at this time'). Faculty members are often approached by many students and may not have the capacity in their labs to accommodate every student who reaches out.
- e) *Be open about your interests and show interest in their area of expertise* when you do get invited for a meeting with a faculty member. Talk broadly about your interests in health and disease and specifically about your interest in their field (do your research, know their background). Also be prepared to talk about your plans post-graduation.
- f) *Keep your resume updated* and ready to share with potential practicum mentors. Do the same for your list of GDB Restricted Electives. If you are still looking for REs, ask a potential faculty mentor what classes they would recommend to enhance a possible **GDB Practicum** experience in their lab or group.
- g) *Talk about potential questions/hypotheses* during your meetings or e-mail exchanges with potential Practicum Mentors. Discuss how you would like to answer that question or test that hypothesis. You may not get to work on that question or hypothesis, but it shows that you are serious about the research.
- h) *Ask what kind of **GDB Practicum** experience is most appropriate* in the group/lab of this faculty member: wet-lab, big data exploration, survey and analysis, fieldwork, or a meta-analysis of the scientific literature? Keep in mind that your **Practicum Project** may be a smaller part of a larger project that the **Practicum Mentor's** research group is already working on, which is perfectly fine. This might mean that you will be working closely with a graduate student or postdoc in their group.
- i) *Remember professionalism and ethics*. Make sure that as a GDB 189 student you adhere to basic rules you may have discussed with your **Practicum Mentor**. These may include sticking to the time of mutually agreed upon meetings, on-time completion of tasks, showing up to meetings on time, being in the lab when you say will be there, communicating in a timely manner if and when something unexpected comes up, respecting the time not only of the instructor but of other team members like students, lab managers, and postdocs, etc. Many mentors will communicate with their group members via e-mail, so plan to check your UC Davis e-mail at least daily, or consider sharing a personal e-mail address with your mentor if you check that account more regularly.
- j) *Are you and your potential mentor unsure whether to commit to a **GDB 189** experience?* Explore with the faculty member the possibility of first doing a '192' variable unit internship, a '199' special study, or similar, in their laboratory: this will offer an opportunity to check each other out and decide whether or not you make a good **GDB Practicum** mentee/mentor match.

GDB Practicum during the COVID-19 pandemic

The GDB Advising Staff is very aware of the restrictions that the Covid-19 pandemic has placed on the plans and hopes of GDB students to do an in-person research practicum in times when many labs on campus are on lockdown. To help our students, we offer the following message from the GDB Lead Faculty Advisor, Dr. Johan Leveau, for students to copy and paste, in its entirety, as part of your email to UC Davis faculty members as potential Practicum Mentors.

A message from the Global Disease Biology (GDB) Master Advisor, Dr. Johan Leveau:

Dear UC Davis colleague – thank you for considering to serve as a practicum mentor to one of our GDB students. As explained by the student already in their email message above, and further detailed in the attached document, the GDB practicum offers students in our major a one- or two-quarter experience to explore the scientific method while working on a research project under the guidance of a UC Davis faculty member.

Unfortunately, the ongoing Covid-19 situation rules out for many of our students a chance to actually work in person in the laboratory of faculty along with their lab members. With this message, I would like to point you to several alternatives (see below) that you as a mentor may wish to explore with your potential mentee and that do not require the GDB student to be physically present in the lab, yet still allow a practicum experience.

I hope you will consider these remote alternatives as you weigh the decision to serve as the practicum mentor for our GDB student. Feel free to share and discuss the alternatives with anyone in your lab (grad student, postdoc) who might be working with the GDB student on their (remote) project, as applicable. If you have other ideas for alternative practicum experiences, specific to your lab or more generally speaking, I would love to hear!

Best wishes,
Johan Leveau

- 1) You may have a data set that needs to be organized and/or analyzed as part of an ongoing or back-burnered project. Perhaps this could be handled remotely by the student.
- 2) Another example of a distanced project is the systematic literature review that addresses a question you and your GDB student might be interested in and for which the answer may be sought not through lab experiments but through an analysis of the literature (see <https://pubmed.ncbi.nlm.nih.gov/30089228> for one approach to this).
- 3) Another alternative involves taking advantage of the many citizen science projects out there (for example, see <https://www.zooniverse.org/projects>) which offer students a way to engage with data that are not necessarily theirs or yours, but that pertain to your field of expertise and that were generated with a particular research question in mind. There would be much added value to the student experience of analyzing those data with you in a supervisory role beside them, to address questions about the why and how of the research and data, and to offer guidance on the interpretation and presentation of the analyzed data.

6. How do I register for GDB 189?

Prior to the start of the quarter in which you plan to take GDB 189, you need to request a Course Reference Number (CRN) from the GDB Advising Staff. By the time you request the CRN, you should already have identified your **Practicum Mentor** and you should accompany your CRN request with an attached or forwarded e-mail from your **Practicum Mentor** confirming that they are willing to serve in that capacity for the upcoming quarter and that you shared the Guide to the GDB Practicum with them. Without such a confirmation e-mail, you will not be given a CRN and you will not be able to enroll in GDB 189.

Your **Practicum Mentor** may use the below template to confirm participation in your **GDB Practicum**:

"My name is (Professor Name) and I agree to be the Instructor on Record for GDB 189, a 3-unit course that allows (Student Name) to work on their GDB practicum project during (Quarter, Year). I will mentor the student through their practicum completion, track their progress and address their questions and concerns. I will also help them with the writing of their GDB practicum report, which the student will submit as part of a separate companion class (GDB 189D), along with a cover page that bears my signature to signify that I read the submitted final report and approve its submission ."

Important to know is that the CRN for **GDB 189** is both quarter- and instructor-specific. This means you cannot use the CRN number of another student who is or was enrolled in **GDB 189**. **GDB 189** can be repeated once for credit, but for the second quarter you need to request a new CRN, even if it is with the same mentor.

If the **Practicum Mentor** that you are proposing is not eligible (i.e. is non-UC Davis faculty), they cannot also serve as your **GDB 189 Instructor of Record**. In that case, you will need to identify a UC Davis faculty member that is willing to serve as your **GDB 189 Instructor of Record**. Students should consult with their **Practicum Mentor** about whom to approach for this function, as it makes most sense to find someone with a background on the topic of research that will be done as part of the **GDB Practicum**. The role of the **GDB 189 Instructor of Record** in this particular situation is to provide input as needed, to grade the student Pass or Not Pass for **GDB 189** in consultation with the Practicum Mentor, and to co-sign the cover sheet that accompanies the submission of the **Practicum Report** (see section 7). In this case, the **Practicum Mentor** and **GDB 189 Instructor of Record** are two different people.

7. What is GDB 189D and how do I register?

Students should enroll in **GDB 189D** either in the same quarter as the one in which they take GDB 189, or in a subsequent quarter. The CRN changes every quarter for GDB 189D, but it is the same for all students enrolled in the same quarter. To register, please email gdb-advise@ucdavis.edu for the CRN.

As explained already, this class meets as a group once during the start of the quarter, with office hours during the remainder of the quarter.

The **Practicum Report** is the deliverable for this class. Typically, it is due by the last day of instruction for the quarter. There are specific expectations for the format of the **GDB 189D** practicum report. These will be explained in more detail during the mandatory orientation meeting of this class, but in short, the report should look like a scientific manuscript, with title, abstract, introduction, methods, results, discussion and references. Students should talk to their **Practicum Mentor** to see what they think might be the best format to present the research results. Examples of previously accepted practicum reports will be shared during the orientation meeting and several are available for viewing in the GDB advising office.

All practicum reports need to be submitted in PDF format, along with a cover page (template will be provided) that includes student name, title of the practicum report, and a signature by the student, **Practicum Mentor** and/or **GDB 189 Instructor of Record**. Submission of the practicum report must be done online through Canvas. Grading for **GDB 189D** will be on a Pass/Not Pass basis. The most important criterion for passing is approval of the report by your **Practicum Mentor** and/or **GDB 189 Instructor of Record**, as evidenced by their signature on the cover page.

8. What else should I know about GDB189/GDB189D and the GDB practicum?

GDB 189 and **GDB 189D** are required classes for students in the GDB major. Put another way: you cannot graduate with a BSc degree in GDB from UC Davis without a Pass grade for both GDB 189 and GDB 189D. Our advice to start looking for potential practicum mentors early stems from our experience that some students start too late, run out of time, and find themselves having to enroll into (and pay for) one or more extra quarters to satisfy the GDB 189/GDB 189D requirement.

9. What if I still have questions after reading this Guide?

If you still have questions about the **GDB Practicum**, **GDB 189** or **GDB 189D**, please contact the GDB advising staff by phone or e-mail at (530) 754-4131 or gdb-advise@ucdavis.edu.