

MCIP QUALIFYING EXAM REQUIREMENTS

Revised SQ2019

Purpose of the QE

- ❑ Primary purpose is to evaluate the student's competence in physiology as a whole and the student's chosen area of specialization in particular.
- ❑ QE is usually scheduled within 1 quarter of completing coursework.

QE Committee

- ❑ Five faculty members, at least four of whom are members of MCIP
- ❑ The major professor and close collaborators will be excluded from serving
- ❑ Faculty are assigned by the MCIP Educational Policy Committee in Winter of 2nd Year after input from the student and major professor
- ❑ Chair of Graduate Council has final approval

Timeframe for the QE

- ❑ You must take your QE after finishing your coursework and **before** the beginning of the 3rd year.
- ❑ **YOU** are responsible for scheduling the date, time and place of your exam
- ❑ Should you need special accommodations for your QE you should put the request to the Chair of you QE committee
- ❑ Meet with your committee members 2 months prior to your QE date
- ❑ Give your committee your written proposal at least one week prior to your exam date

Format of the QE

- ❑ The QE must include both of the following components with a greater proportion on the core and specialization areas emphasizing the integration of physiology in the student's area of emphasis:
 - A dissertation research proposal
 - An examination on the core physiological subject areas and specialization.
- ❑ As a reminder, "...Graduate Council policy is that neither the program nor the QE committee shall impose any expectation that the student will provide refreshments during the examination."

Unavoidable Absences

- ❑ **All committee members are required to stay for the entire exam.** If there are any unanticipated or unavoidable absences, the chair will report them and provide specific details for a plan to complete the exam within 72 hours, when all committee members may attend.
- ❑ If the chair is absent, remaining members shall wait a reasonable time, attempt to contact the chair, and then suspend the exam. In this case, the chair shall report the result as “No Examination” and provide a detailed explanation of the circumstances. A rescheduled exam must be conducted in the same manner and format intended for the original exam.
- ❑ Remote participation by a member of the committee is allowable following the rules and procedures in the Policy on Service on Advanced Degree Committees (GC1998-01), found at <http://gradstudies.ucdavis.edu/gradcouncil/policiesall.html>.

Timeframe for the Exam

- ❑ The total exam will not last longer than 3 hours
- ❑ The presentation of the research proposal should only take 15-20 minutes.
- ❑ Discussion of the research proposal should not last longer than 45 minutes.
- ❑ The exam will be administered on a chalk/whiteboard only (NO powerpoint)

Dissertation Research Proposal

- ❑ Specific aims –the broad, long-term objectives of the work and the specific purposes of the proposed research)
- ❑ Background and significance - Critically evaluate existing knowledge, and identify the gaps that the project is intended to fill
- ❑ Preliminary studies and/or research design and methods
- ❑ References
- ❑ The total length should not exceed 5 pages for all sections.

Examination on the core physiological subject areas & specialization

- ❑ This will be the greater proportion of the QE

Expectations of the student

- ❑ The student has acquired sufficient knowledge in breadth and depth to be conversant with the general principles of physiology
- ❑ The student should be able to integrate those principles around a physiological question or concept

Expectations of Faculty

- ❑ The individual committee members' questioning on the core physiological subject areas and specialization should emphasize the integration of concepts learned through coursework rather than a restatement of facts already examined during the student's coursework.
- ❑ The QE chair is obligated to ensure that QE committee evaluates the student's capacity to integrate physiological principles as well as test fundamental knowledge of physiology
- ❑ The QE committee members as well as the QE chair commit to administering the QE per MCIP guidelines and according to UCDavis Graduate Studies policy (https://grad.ucdavis.edu/sites/default/files/upload/files/grad-council/qe_policy_approved_4-1-2011.pdf)

Expectations of Faculty

- ❑ Prior to the QE, the committee will meet as a whole to coordinate the questioning of the student and clarify expectations during the exam

QE training

- ❑ MCIP faculty may not be aware of what we mean by "integrative questions" -- in past QEs many such questions have missed the mark in some way -- sometimes by a mile.
- ❑ Our MCIP committee finally decided the best way to effectively address this recurring issue was to hold an annual meeting, a mini workshop.
- ❑ Thus, faculty assigned to QEs are to review this presentation and, if they have further questions, are expected to attend the workshop which will build on examples of integrative questions in this presentation.

Goals of QE training

- ❑ Help establish the level of detail expected for questions
 - at the level of the core MCIP physiology course
- ❑ Provide guidance on how to develop a set of integrative questions
- ❑ Ensure QE is administered according to QE policy

Depth of knowledge

- ❑ The MCP 210 IORs agreed to adopt the **Boron and Boulpaep (Medical Physiology) text** as a universal reference in an effort to establish a standard level of presentation and to provide other faculty with an indication of the depth of knowledge they might expect from students in the QE.
- ❑ The MCP 210 IORs also shared syllabus and slides used in the courses with CEP for distribution to faculty upon request

Textbooks

- ❑ Title: Cardiovascular Physiology
Author: MOHRMAN
Publisher: MCG
Edition: 7TH 11
ISBN: 9780071701204
- ❑ Title: Renal Physiology
Author: VANDER
Publisher: MCG
Edition: 8TH 09
ISBN: 978007179748-1
- ❑ Title: Medical Physiology
Author: BORON
Publisher: ELSEVIER
Edition: 2ND 12
ISBN: 9781437717532
- ❑ Title: EBK Medical Physiology
Author: BORON
Publisher: ELSEV COUR
Edition: 2ND 12
ISBN: 9781455733286
- ❑ Supplemental Text:
Title: Cellular Physiology and Neurophysiology
Authors: Blaustein, Kao, & Matteson
Publisher: Elsevier Mosby
Edition: 2ND 11
ISBN: 9780323057097

Integrative Questions

- ❑ “Integrative” is a major component of the MCIP name, but many do not know how to define what it is.
- ❑ How does MCIP integrate coursework?
- ❑ How do you develop integrative questions?
- ❑ Are there examples of integrative questions that can help student prepare for their QE?

Dictionary

- ❑ 1 : to form, coordinate, or blend into a functioning or unified whole : unite
- 2 : to find the integral of (as a function or equation)
- 3 a : to unite with something else b : to incorporate into a larger unit
- 4 a : to end the segregation of and bring into equal membership in society or an organization
b : desegregate <integrate school districts>

Integrative physiology can have many meanings

- ❑ Multidisciplinary research – especially by having collaborative work among labs with very different emphases.
- ❑ Using a diversity of techniques to study one topic
- ❑ Understanding how basic knowledge in one discipline can apply to a different discipline.
- ❑ Vertical integration from molecular to/from whole animal physiology

Integration in MCP210

- ❑ Recurring themes are brought up throughout the year.
- ❑ Physiology of exercise: Dr. Navedo in the Endocrine section; Exercise physiology is also a topic addressed by Dr. Raybould in the context of GI physiology and Dr. Baar in dealing with metabolism.
- ❑ The same repeated thematic approach characterizes the discussion of glucose homeostasis, stress and environmental physiology and immunology.

Developing integrative questions

- ❑ The depth of knowledge expected should be geared to the current MCP 210 series for all areas except the specific area of research.
- ❑ Think about a specific concept or topic that you want to test.
- ❑ How does that concept relate to other areas of physiology?

Developing integrative questions: example #1

- ❑ Inappropriate
- ❑ “Diagram glycolysis, identify the control points, and the effectors of those control points.”
- ❑ Very detailed, and requires memorization, not integration

Developing integrative questions: example #1

- ❑ Appropriate
- ❑ The high-protein, low-carbohydrate diet is recognized as a dietary regime that allows for body weight and body fat loss. Describe the difference in the hormonal milieu in the liver relative to a “normal” diet compared to the high-protein, low-carbohydrate diet and detail the effects on the control points for hepatic gluconeogenesis, glycolysis, Fatty acid synthesis and beta-oxidation and use these points to develop a hypothesis for the mechanism of action of the high-protein diet on body fat and weight loss.

Developing integrative questions: example #2

- ❑ Inappropriate
- ❑ “Describe how bile is synthesized.”
- ❑ No integration

Developing integrative questions: example #2

- ❑ Appropriate (good level and integrative)
- ❑ Contrast the gastrointestinal, cardiovascular, and pulmonary characteristics of the fight or flight responses.
- ❑ Physiological regulation of gastric function is mediated by neurocrine, endocrine, and paracrine pathways. Pick a gastric function, and give examples of the specific mediators for each of the 3 pathways regulating it.

Developing integrative questions: example #3

- ❑ Inappropriate
- ❑ Explain how Hodgkin and Huxley, winners of the Nobel prize in physiology and medicine, related conduction velocity and the traveling wave equation to their model of membrane permeability changes for an action potential. (Requires an advanced understanding of traveling waves and the relationship of these waves to a model based on voltage-clamp measurements, material not covered in core course. Moreover, this is not an integrative question.)

Developing integrative questions: example #3

- ❑ Appropriate
- ❑ Contrast physiological signaling mechanisms of neurons and endocrine cells. Based on this comparison, speculate on whether it is likely or unlikely that mammals will ever evolve that have only neurons or only endocrine cells.

Developing integrative questions: example #4

- ❑ Inappropriate
- ❑ Draw a representative neuron, label its components, and describe the principle function of each component. (This is again not an integrative question, and is pitched at an inappropriate elementary level.)

Developing integrative questions: example #4

- ❑ Appropriate
- ❑ Describe the physiological responses to a meal, including the mechanisms that regulate the cephalic, gastric, and intestinal phases of digestion.

Practical information for QE chairs

- ❑ Do NOT proceed with the QE unless all members are present
- ❑ Do **NOT** proceed with the QE unless you received the appropriate paperwork from graduate studies!
- You will only receive the paperwork if student filed the QE application document at least 3 weeks before the proposed exam date.

UC DAVIS
GRADUATE STUDIES

Qualifying Examination Application for the Degree of Doctor of
[] Philosophy (Ph.D.) [] Education (Ed.D.) [] Engineering (E.Eng.)

Qualifying Examination Applications should be submitted to Graduate Studies by 3:00 p.m. three weeks prior to the proposed exam date.

Last Name	First Name	Middle Name	Student ID Number
Current Address	City	State/Zip Code	E-mail
Major Professor	Graduate Program	Proposed Examination Date	

The applicant will be examined on these subjects:

Recommended for consideration to conduct the qualifying examinations are (one external member is required):																												
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Signature of Associate Professor _____
Associate professor requires approval of the Associate Dean for Graduate Studies.

Changes to committee membership require submission and approval of a Petition for Reconstitution of Committee Membership prior to the examination taking place.

No. 1014 No student signature required 10/2014 1

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DEPARTMENT CERTIFICATION (for all students)

I certify that the above student has completed all required course work and is prepared to take the Qualifying Examination for the Degree of Doctor of Philosophy.

Graduate Program Advisor Signature _____ Date _____
Associate Professor

First Graduate Program Advisor's Name _____

Graduate Program Coordinator Signature _____ Date _____
Associate Professor

First Graduate Program Coordinator's Name _____

FOR STUDENTS ADMITTED TO A DESIGNATED EMPHASIS (DE) ONLY

Designated Emphasis in _____
Committee Member (person who will exam for the Designated Emphasis)

Chair of Designated Emphasis Signature _____ Date _____
First Chair of Designated Emphasis Name _____

GRADUATE STUDIES SECTION

Student's Name _____ Student Last Registered _____ Participation Date _____ S.P.A. _____
Chairman _____

APPROVED

Associate Dean of Graduate Studies Signature _____ Date _____
Staff Initials _____

No. 1014 This space reserved for graduate studies 10/2014 2

- If you proceed with the exam without the appropriate paperwork the exam is nullified

Practical information for QE chairs

- ❑ The paperwork you receive include Graduate studies QE policy, student transcript and Report on Qualification Examination for admission to candidacy
- ❑ Every effort should be made to achieve a unanimous decision
- ❑ Whatever the outcome of the QE the results should be communicated to the student, Graduate Studies, and MCIP (via the program coordinator Nicole Raboud) within 72 hours.

Practical information for QE chairs

- ❑ The possible QE outcomes are pass, non-pass, and fail. However during a 2nd QE attempt the result can only be pass or fail.
- ❑ In the event of a non-pass or fail outcome the QE chair should make sure a thorough evaluation of the student performance is written down and agreed upon by all committee members. In the event of a split decision both the minority and majority opinion should be noted with a tally of the votes for each. A clear account of the student performance deficiencies is needed should a QE decision be appealed.
- ❑ In the event of a non-pass the QE chair should contact MCIP CEP (master advisor Professor Chao-Yin Chen) as soon as possible to discuss possible remediation options. For example is the proposed coursework available within the timeframe before the 2nd QE attempt,...

