PHPS 736
Pharmaceutical Immunology
CRN: 11916

Fall 2019

Course Coordinator:
Susan I. Jarvi, PhD
Professor
jarvi@hawaii.edu

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Section 1: Course Information

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Course Title: Pharmaceutical Immunology
Course Alpha-Numeric: PHPS 736
CRN: 11916
Credits: 3 credits

Class Time and Location:

Room	Day	Time
LPLH-1	Tuesdays	1:00 pm – 1:50 pm; 2:00–2:50 pm
LPLH-1	Wednesdays	2:00 pm – 2:50 pm

Course Description:

Basic concepts of immunology including innate immunity, antigen recognition, lymphocyte development and adaptive immunity will lay the groundwork for understanding immunity in a clinical context. Students will come to understand that the immune system exists to protect the human host from infection but that the development of allergy, autoimmunity, graft rejection and immunity to tumors are all variations of this function. Students will discover how we can pharmacologically manipulate the immune system by vaccination and other means. They will also review immunotherapeutic applications, immune modulation, immunodiagnostics, and complete a immunology-related comprehensive paper on a subject TBD.

Course Structure:

This course is lecture, and discussion-based. During lecture, a non-graded 5 question iClicker quiz (iClicker Cloud) will be given at the end of each hour on each Tuesday. At the end of the hour on each Wednesday, a graded iClicker quiz will be given which includes one question from each of the non-graded quizzes and three new questions based on lecture material that week. Both non-graded questions and graded iCLicker quizzes must be conducted on a laptop computer. Students will be graded based on response to questions on quizzes and exams and paper.

Prerequisites:

Fulltime students in the DKICP PhD program may enroll in this course.
Additional pre-requisites include: Approval of major Professor

Course Goals and Objectives

1. Describe the basic principles and advances in understanding of innate immunity and adaptive immunity.
2. Describe structure and function of lymphatic tissues.
3. Recognize the significance of innate inflammatory responses and their role in triggering adaptive immune responses.
4. Describe the process of clonal selection in generation of specific lymphocytes in adaptive immunity.
5. Describe the cells involve in innate and adaptive immunity, functions and where they originate.
6. Describe the developmental processes of lymphocytes.
7. Describe how lymphocytes recognize antigens and current advances.
8. List major cytokines and roles in immune function.
9. Describe appropriate uses of immunotherapeutic cytokines and monoclonal antibodies.
10. List the basics steps involved in signaling in the immune system.
11. Describe the basic steps in the development of immunologic memory and implications for vaccines and advances in vaccine development.
12. Describe required vaccines and immunity to them.
13. State how some disease states are caused by failure of immune system mechanisms and advances in HIV treatments.
14. Describe mechanisms responsible for hypersensitivity and the implications for the treatment of allergy (including drug allergies) and advances in development of anti-allergy drugs.
15. Describe how the body recognizes “self” and how this relates to auto-immune states and transplant rejection and significance of stem cell research and growing body parts.
16. Describe the mechanisms of action and advances in development of immunosuppressive drugs.
17. Recognize the significance of the immune system in cancer development and the current advances in cancer treatments.
18. Describe how the use of biotechnology to aid in the understanding of and diagnosis of immune system pathology and research.
19. Recognize the importance of mucosal immunity, significance of the microbiome on immune system development and impacts of prebiotics and probiotics.
20. Describe how antibacterial drugs impact the immune system and potential alternative approaches.

Attendance Policy:

Students are expected to devote their entire efforts to the academic curriculum. This includes 100% attendance and active engagement both didactic and experiential coursework.

Instructor Information:

Instructor: Susan Jarvi, PhD
Office: Research Mod C-111
Telephone: 808 932 7701
E-mail: jarvi@hawaii.edu

Textbook and Course Materials

Required:

"The immune system" 4th edition, Peter Parham, Garland Science.

Reference material to be provided by the Instructor:

Katzung and Trevor Pharmacology Chap 55 Immunopharmacology
https://cletus.uhh.hawaii.edu:5600/content.aspx?sectionid=95705051&bookid=1568&Resultclick=2

Basic and Clinical Pharmacology Chap 55 DF Lake, AD Briggs Immunopharmacology

https://cletus.uhh.hawaii.edu:5600/content.aspx?sectionid=175224717&bookid=2249&Resultclick=2

Scientific papers and chapters as assigned.

Kuby Immunology, 7th edition. JA Owen, J Punt, SA Stranford, PP Jones. WH Freeman and Co NY. 2013.

"Applied Therapeutics: The clinical use of drugs" MA Koda-Kimble et al., 9th ed. Wolters Kluwer/Lippencott, Williams and Wilkins 2009.

Pharmacists' Patient Care Process (PPCP):

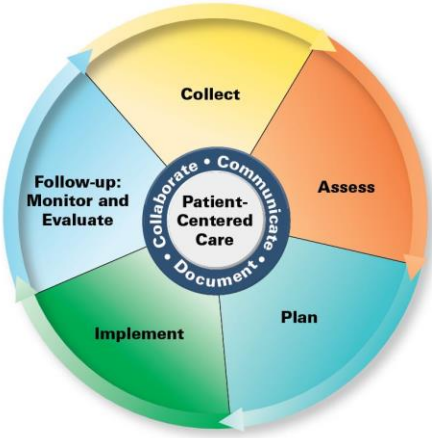

Figure 1: Pharmacists' patient care process

Pharmacists' Patient Care Process
Pharmacists use a patient-centered approach in collaboration with other providers on the health care team to optimize patient health and medication outcomes.

Using principles of evidence-based practice, pharmacists:

Collect
The pharmacist assures the collection of the necessary subjective and objective information about the patient in order to understand the relevant medical/medication history and clinical status of the patient.

Assess
The pharmacist assesses the information collected and analyzes the clinical effects of the patient's therapy in the context of the patient's overall health goals in order to identify and prioritize problems and achieve optimal care.

Plan
The pharmacist develops an individualized patient-centered care plan, in collaboration with other health care professionals and the patient or caregiver that is evidence-based and cost-effective.

Implement
The pharmacist implements the care plan in collaboration with other health care professionals and the patient or caregiver.

Follow-up: Monitor and Evaluate
The pharmacist monitors and evaluates the effectiveness of the care plan and modifies the plan in collaboration with other health care professionals and the patient or caregiver as needed.

The DKICP prepares students to provide high quality patient-centered care through the introduction, utilization and reinforcement of the "Pharmacists' Patient Care Process Model"

During didactic lectures, students will gain the necessary knowledge base to collect, assess, plan, implement and follow up on commonly encountered disease states. Workshops will further reinforce the application of the principles of the patient care process as well as simulate opportunities for collaboration, communication and documentation.

Section 2: Course Assessment

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Assessment Schedule:

Method	Date	Time	Location	Points
Exam 1	Sep 27	8:00 am – 9:50 am	LPLH-1, LPLH-2	100
Exam 2	Oct 28	9:00 am – 10:50 am	LPLH-1, LPLH-2	100
Final	Dec 19	9:00 am – 11:00 am	LPLH-1, LPLH-2	100
Quizzes	Weekly	Wed in class	LPLH-1	100
TOTAL COURSE POINTS				400

Description of Assessments:

There will be 2 exams during the course and one partially cumulative final exam; each exam will count for 100 points (50 multiple choice questions). Additionally, a minimum of 14 scheduled weekly iClicker quizzes (iClicker Cloud) will be administered throughout the semester (10 pts each). Points from the top 10 quiz grades will apply towards final grade. All iClicker non-graded questions and graded quizzes must be conducted on a laptop. Each student will be assessed on four paper/chapter presentations and response to questions, and one homework assignment. Assessment will be graded Pass/Fail and students must be graded "Pass" in order to pass the course. A total of 400 points is possible and final grade is based on percentage achieved by the individual student.

Grade Scale:

A	>91.45	B-	78.45-81.44
A-	88.45-91.44	C+	75.45-78.44
B+	85.45-88.44	C	69.45-75.44
B	81.45-85.44	F	< 69.45

Passing this Course:

Students receiving a letter grade of C or higher and a "Pass" assessment for the weekly presentation/discussion will pass this course.

Exceptions/Excuses from Required Course Activities:

Students may be excused from required course activities (including, but not limited to: exams, quizzes and workshops) and provided an opportunity to reschedule a make-up activity for unforeseen issues such as documented medical emergencies, illness, or death in the immediate family. Other reasons may be allowable in extenuating circumstances. For consideration of other reasons (personal/professional) students must contact the course coordinator at least two weeks prior to the scheduled course activity. The decision to allow or not allow the rescheduling of a mandatory event is at the sole discretion of the Associate Dean for Academic Affairs. The course coordinator shall inform the student of the outcome at least one week prior to the scheduled course activity. Forms may be downloaded from the DKICP website: http://pharmacy.uhh.hawaii.edu/currentstudents/documents/AbsenceRequestForm.pdf

Course and Instructor Evaluations:

Students will have the opportunity to provide online course and instructor-level evaluations at the end of the semester.

Students who complete all evaluations for this course and submit them by Monday, December 16 at 9:00 am will receive an additional 1% of total points available [4 POINTS]. PLEASE NOTE: Students MUST receive a passing grade in the course to be eligible to receive these bonus points.

Center for the Advancement of Pharmacy Education (CAPE) Educational Outcomes:

The following list of CAPE Educational Outcomes apply to this course:

Domain 1 – Foundational Knowledge

1.1. Learner (Learner) - Develop, integrate, and apply knowledge from the foundational sciences (i.e., pharmaceutical, social/behavioral/administrative, and clinical sciences) to evaluate the scientific literature, explain drug action, solve therapeutic problems, and advance population health and patient- centered care.

1.1.2. Articulate how knowledge in foundational sciences is integral to clinical reasoning; evaluation of future advances in medicine; supporting health and wellness initiatives; and delivery of contemporary pharmacy services.
1.1.3. Integrate knowledge from foundational sciences to explain how specific drugs or drug classes work and evaluate their potential value in individuals and populations.
1.1.4. Apply knowledge in foundational sciences to solve therapeutic problems and advance patient-centered care.
1.1.5. Critically analyze scientific literature related to drugs and disease to enhance clinical decision making.
1.1.6. Identify and critically analyze emerging theories, information, and technologies that may impact patient-centered and population based care.
1.1.8. Describe disease states at a molecular, cellular and tissue level as a basis for future understanding of drug action.

Section 3: Course Schedule

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Note: This schedule is tentative and subject to change depending upon the progress of the class.

Date	Day	Lecture #	Topics	Reading Assignments
8-27-19	T	1,2	Elements of Immune system	Introduction Parham 1
8-28-19	W	3	Elements of Immune system	Parham 1
9-3-19	T	4,5	Innate Immunity	Parham 2
9-4-19	W	6	Innate Immunity-immediate response	Parham 2 Parham 3
9-10-19	T	7,8	Innate Immunity- induced response	Parham 3
9-11-19	W	9	Antibody structure, B cell diversity,	Parham 4
9-17-19	T	10,11	Antibody structure, B cell diversity,	Parham 4,5
9-18-19	W	12	Antigen recognition by T lymphocytes	Parham 5
9-24-19	T	13,14	Development of B cells	Parham 6
9-25-19	W	15	Review	
9-27-19	F		Exam 1 8-9:50 am	
10-1-19	T	16,17	Development of T cells	Parham 7
10-2-19	W	19	T cell-mediated immunity	Parham 8
10-8-19	T	19,20	T cell-mediated immunity	Parham 8
10-9-19	W	21	Immunity, B cells and antibodies	Parham 9
10-15-19	T	22,23	Immunity, B cells and antibodies	Parham 9
10-16-19	W	24	Preventing defenses at Mucosal surfaces	Parham 10
10-22-19	T	25,26	Preventing defenses at Mucosal surfaces Immunological memory and vaccination	Parham 10 Parham 11
10-23-19	W	27	Review	
10-28-19	M		Exam 2 9-10:50 am	
10-29-19	T	28,29	Coevolution innate and adaptive immunity	Parham 12
10-30-19	W	30	Failures of the body's defenses	Parham 13
11-5-19	T	31,32	Failures of the body's defenses	Parham 13
11-6-19	W	33	IgE-mediated immunity and allergy	Parham 14
11-12-19	T	34,35	IgE-mediated immunity and allergy	Parham 14
11-13-19	W	36	Transplantation	Parham 15
11-19-19	T	37,38	Autoimmune disease	Parham 16
11-20-19	W	39	Autoimmune disease	Parham 16
11-26-19	T	40,41	Cancer and the immune system	Parham 17
11-27-19	W	42	Cancer and the immune system	Parham 17
12-3-19	T	43,44	Immunomodulation Therapy- Cytokines -Immunotherapeutic uses of cytokines	Kuby Chap 4 Material provided

			and monoclonal antibodies.	
12-4-19	**W**	**45**	**Immunodiagnosis- Ab detection, Immunoassays, Flow cytometry, Microarrays**	**Kuby Chap 4 Material provided**
12-10-19	**T**	**46,47**	**TBD**	
12-11-19	**W**	**48**	**Review**	
12-19-19		**EXAM 3**	**Final Exam 3 9-11 am**	

Section 4: Course Policies

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DKICP Academic Policies

Electronic devices: Students are prohibited from using electronic devices such as computers, tablets, or cell phones during class for personal communication (e.g. texting) or internet browsing or for any activities that are not directly related to the course. Failure to comply with this policy may result in the student being asked to leave class for that session.

Academic Honesty: Academic honesty and integrity are expected of all students throughout their course of study at DKICP. Any violation of this code is considered to be a serious academic violation and may result in a reprimand, monetary fine, written warning, academic and/or disciplinary probation, suspension, or dismissal. Academic dishonesty constitutes a breach of academic integrity that violates the academic foundation of an institution and compromises the integrity and well-being of the educational program. The policies on students' academic and professional responsibilities are included in Student Handbook DKICP.

Professionalism Policies:

• Make-up exams (due to illness, family emergency, or approved extenuating circumstances) will generally only be given if the instructor is notified prior to the examination. Failure to take an exam will count as a zero on that exam.
• Missing Exams Documentation will be required for all missed exams.
• Requests for re-grading exam questions may result in the entire exam being re-graded, for all students. Point total errors can be corrected without re-grading the entire exam.
• Attendance at workshop/case sessions is mandatory. Missed workshops will result in no points for that session. Possible make-up assignments will be assigned for missed workshop(s) with instructor discretion.

Cell Phones, Pagers &Other Communication Devices: All cell phones, pagers etc. are to be on silent mode during class or turned off! Cell phones and pagers are NOT to be answered during class time. Students are not permitted to engage in any electronic communication during class time, unless approved by the lecturer. Students who do engage in unapproved electronic communication during class time will be asked to leave.

Dress Code: On campus, the mode of dress is determined by each student's professional judgment, unless a course has a required dress code. Clothing having caricatures, messages, symbols, etc., that can be construed based on societal norms to be vulgar, offensive or to contribute to creating a

hostile learning/academic environment is considered to be unacceptable attire and demonstrates inappropriate professional judgment that is subject to review and action by the course coordinator.

Attendance Policy: University of Hawai'i at Hilo encourages 100% attendance by students at all course-related sessions, lectures, laboratories, and clinical assignments. Each college or department has the prerogative to establish its own attendance requirements and policies. Unless a department's policy differs, class attendance is mandatory for all students for the first session of each course in each quarter as well as on the first day of class after scheduled vacations and University holidays. If illness, a personal emergency, personal incapacitation, or other exceptional problem of a serious nature causes a student to be absent from a session requiring mandatory attendance, the student must immediately notify the course coordinator and follow stated course policies and procedures. Unexcused absences during these or other mandatory attendance sessions may result in course failure.

DKICP Exam Policy (Electronic Exams)

The DKICP Exam Policy intends to promote academic integrity by delineating a well-defined, clearly articulated, fair process for administering exams. Students who do not adhere to the exam policy will be subject to academic disciplinary action and will be formally referred to the Associate Dean of Academic Affairs.

PRIOR TO THE EXAM DAY: It is the student's responsibility to:
- download the most up-to-date version of Examplify
- download the relevant exam by the deadline set by the course coordinator
- contact DKICP IT department if s/he is unable to complete the above steps by the designated time
The instructor will post the exam and distribute the download code no later than one week before the exam seating.

ON THE EXAM DAY: Students must bring a laptop computer (that is compliant with the DKICP technical specifications and has a fully charged battery) with the latest version of Examplify installed, a power cord, their personal wireless login username and password, Examplify username (UHH ID number) and login.
Students should disable the sleep/hibernate mode on your computer before the exam. Some computers go into sleep/hibernate mode during extended periods of nonuse. During an exam, it can be difficult to exit this mode. Refer to the instructions for your operating system to modify these settings.

ARRIVE ON TIME: Students are expected to arrive on-time for all exams. Students who arrive more than 5 minutes late for an exam will NOT be allowed to enter. (Emergency situations will be taken into consideration on a case by case basis; documented proof of the emergency may be required). Late arrival is unprofessional and disturbs the concentration of other students.

DISPLAY DKICP STUDENT PHOTO ID CARD: Students must display their student ID card with their photo and name readily visible at all times during the exam.

PLACE ALL BELONGINGS IN THE FRONT OR REAR STORAGE AREA OF THE CLASSROOM: Students must place all of their belongings in the storage area of the classroom before they sit for the exam.

CELL PHONES and ELECTRONIC DEVICES OTHER THAN A LAPTOP COMPUTER MUST be removed from clothing/pockets, turned off and placed in the front or rear storage area of the classroom. Disruption of an exam due to an electronic device may be subject to academic disciplinary action.

NO HATS, HOODIES or SUNGLASSES: Students are not allowed to wear any attire covering their head or eyes, including hats, hoodies or sunglasses.

SIT SEPARATED: When space allows students are required to sit with at least one empty chair between themselves and students to either side.

DESKS MUST BE KEPT CLEAR: Students are allowed to have a laptop computer, mouse, power cord, pencil, scratch paper if provided by the instructor (students must write their name at the top of the scratch paper and turn it in when they leave the exam), and DKICP student photo ID card on their desks. No other items will be allowed on the desk or around the desks of students during exams.

STUDENTS LAPTOPS MUST REMAIN CLOSED UNTIL THE PROCTOR GIVES INSTRUCTIONS TO OPEN THEM.

NO FOOD OR BEVERAGES: Food and/or beverages are NOT allowed during an exam.

CALCULATORS: If a calculator is required for the exam, only non-programmable calculators will be allowed.

EXAM PASSWORD DISTRIBUTION: Once everyone is seated and has opened Examplify, the proctor will show the exam password on the screen. At this point everyone enters the password and begins at the same time. Computer speeds vary but every student will be given the allotted time to complete the exam.

NO TALKING or OTHER COMMUNICATION ALLOWED BETWEEN STUDENTS DURING EXAMS: Any talking, disruption or suspicious behavior will be documented by proctors, reviewed by the course coordinator and Associate Dean of Academic Affairs and subject to academic disciplinary action.

EXACT TIME LIMITS: All exams are set with a pre-determined time limit by the course coordinator. At the end of each exam period, Examplify will end the exam.

**Students who complete their exam early are allowed to upload their exams (see below) and leave quietly.

UPLOADING THE EXAM: When students have completed the exam, they will follow the on-screen instructions to upload their answer file. Students must ensure that their answer file has been uploaded before they leave the classroom. Once students reach the confirmation of upload screen they should alert a proctor who will record their submission time. Both students and the course coordinator will receive an email verifying that their answer file was uploaded. Students should check they have received this email before they leave the exam. Students should not open any other files or programs on their computer before leaving.

In the event of a technical problem, the instructor determines whether students can leave before uploading is complete. The instructor can then set another upload deadline and students can upload the encrypted exam file from home.

NO TOILET OR PERSONAL BREAKS DURING EXAMS: Students are advised to attend to ALL personal needs before entering the exam room. Once seated, leaving the room for any reason constitutes the end of the exam. In the case of an emergency, students may request permission to leave the exam room by asking the proctor. Any emergency request to leave the room will be documented and reviewed by the course coordinator and Associate Dean of Academic Affairs.

TECHNICAL ASSISTANCE: Students may request technical help at any time during the exam period by raising their hands.

EXAMS MAY BE VIDEO TAPED WITHOUT NOTICE: DKICP reserves the right to video tape any exam at any time without notice.

UH Hilo Title IX Policy

The University of Hawaii is committed to providing a learning, working and living environment that promotes personal integrity, civility, and mutual respect and is free of all forms of sex discrimination and gender-based violence, including sexual assault, sexual harassment, gender-based harassment, domestic violence, dating violence, and stalking. If you or someone you know is experiencing any of these, the University has staff and resources on your campus to support and assist you. Staff can also direct you to resources that are in the community. Here are some of your options:

If you wish to remain **ANONYMOUS**, speak with someone **CONFIDENTIALLY**, or would like to receive information and support in a **CONFIDENTIAL** setting, contact:

- UH Hilo Counseling Services: SSC, Room E-203. 808-932-7465.
- UH Hilo Medical Services: Campus Center, Room 212. 808-932-7369
- Hawaii Island YWCA: 808-935-0677

If you wish to **REPORT** an incident of sex discrimination or gender-based violence including sexual assault, sexual harassment, gender-based harassment, domestic violence, dating violence or stalking as well as receive information and support*, contact:

- Jennifer Stotter, Director of the Office of Equal Opportunity & Title IX Coordinator: 808-932-7641 jstotter@hawaii.edu
- Kalei Rapoza, Director of Human Resources: 808-932-7626 kaleihii@hawaii.edu

* Please note that you do not have to file a report with the University to receive institutional support or assistance.

As a member of the University faculty, I am required to immediately report any incident of sex discrimination or gender-based violence to the campus Title IX Coordinator. Although the Title IX Coordinator and I cannot guarantee confidentiality, you will still have options about how your case will be handled. My goal is to make sure you are aware of the range of options available to you and have access to the resources and support you need.

For more information regarding sex discrimination and gender-based violence, the University's Title IX resources and the University's Policy, Interim EP 1.204, go to: http://www.hawaii.edu/titleix

Students with Disabilities

Any student with a documented disability who would like to request for accommodations should contact the Disability Services Office: 932-7623 (Voice), or 932-7002 (TTY), uds@hawaii.edu Student Services Center, Room E-230, as early in the semester as possible.

Mental Health/ Suicide Prevention

The UH Hilo community is committed to and cares about all students. Life in graduate school can get complicated. Students sometimes feel overwhelmed, lost, experience anxiety or depression, struggle with relationship difficulties, family responsibilities, or diminished self-esteem. However, supportive services are available and effective. UH Hilo Counseling Services helps students cope with difficult emotions and life stressors. Counseling Services is staffed by experienced, professional counselors, who are attuned to the diverse needs of all types of college students. The services are FREE and completely confidential.
Find out more at https://hilo.hawaii.edu/studentaffairs/counseling
or by calling (808) 932-7465

For immediate help, contact:

The Crisis Line of Hawaii: 1-800-753-6879
National Suicide Prevention Hotline: 1-800-273-8255 (www.suicidepreventionlifeline.org)
or text "Aloha" or "Hello" to the Crisis Text Line: 741-741

UH Hilo CARE Team

The UH Hilo Care Team is a multi-disciplinary team who receives referrals about students whose behavior raises significant concerns and reasonably suggests that the behavior, physical and/or emotional state:

- Presents safety issues for the student or others; or
- May hinder the student's ability to meet expected standards of conduct or achieve academic requirements; or
- May be evidence of severe emotional distress

You may make a referral to the Care Team by completing the online reporting form or by contacting K. Kainoa "Kainoa" Ariola-Sukisaki, Care Team Coordinator:
(808) 932-7445

Campus Security

If there is an imminent threat of danger or an emergency please contact Campus Security:
(808) 974-7911