**Course Design Intensive (CDI) Workbook**

This workbook has been created for participants taking the Course Design Intensive (CDI) through the Centre for Teaching, Learning & Technology at UBC. The purpose of this workbook is to support your analytic thinking in the process of building, refining and iterating your course design. This guide also includes background information on each phase of the course design process, which mirrors the  sequence of the workshop. This guide is largely based on the work of Wiggins & McTighe (2005).

This is a “working document”--as you build out your course design, this document (the template charts  and tables) will grow (that is, if you are using it online). We encourage you to adapt the templates to your own needs. You might prefer to change the orientation of the document to “landscape” or you might prefer a printed copy. In this case, we suggest going through the document first, adding white space within the sections to allow you space to write and draft as your ideas emerge.

In addition to the templates and examples in this guide, we’d like to share two of the strategies built into the CDI which support your learning:

**CDI Wiki**

The CDI uses a wiki to curate our resources and share out our facilitation plan. This wiki includes all of the resources used throughout the day (including presentation slides) and discussion activities. There is also an open, online discussion space, with opportunities to add a comment, share a resource, or ask a question (a “muddy point”), where both facilitators and participants can engage in conversation with you. In order to “post” onto the wiki, you need to be logged in (using your CWL)--the ‘login’ button is located on the top left of any wiki page.

View the CDI **Day 1 Learning Plan** here: <http://wiki.ubc.ca/Documentation:Course_Design_Intensive/Facilitators_Guidebook/Day_1_Learning_Plan>

**Design Response Groups (DRG)**

During the CDI, some of the learning will take place in the large group, some in small group activities and discussion, and others in Design Response Groups. The DRG has up to 8 participants and one facilitator and is intentionally designed so that members and facilitators become more familiar with the work of each participant. In this smaller group you will share your course designs in progress, receive input on your ideas, and respond to other members of your design group. In this peer learning context, you will learn from other people’s strategies and decision processes which may spark your own ideas/creativity, and others will learn from you.

# **Part A: Learning Context & Situational Factors**

# *Key Question: What factors influence the design of your course?*

Effective course designacknowledges the context in which it is embedded. Context includes considerations about the learners (who they are and how they learn) and about the broader goals and outcomes defined at the departmental, faculty or societal level (professional bodies).

*Below are four questions for you to consider and document before Day 1 of the CDI. Bring a copy of your work to Day 1 (this can be a digital version).*

**1. What are the known factors or constraints of your course?** *For example: class size, teaching assistant support, technical support, administrative support, role of technology and/or technological support, time, experience, etc.*

**Class time**: 2 hours in-class, maximum 3-4 hours outside of class ideally

**Class size**: Variable between 8 – 20 depending on the year

**Experience**: Ability to critically analyse a scientific argument and evaluate evidence; ability to voice opinions and explain thought process

**TA Support**: In class support and feedback on presentations; Minimal support outside of class hours (unless scheduled consultations)

**Technology**: Google Group for discussions, in-class ppt presentations

**2.  What do you know about the broader goals & context of your course?***How does this course fit into the larger curricular context? What place does your course have in the curriculum (foundational, elective, etc)? Are there pre-requisites? Is it part of a program or set curriculum? Do you have recommended or required pre-requisites for your course? How does this course fit into the department, the institution, the profession?  In what ways is your field or discipline changing and how might this be important?*

- No pre-reqs, seminar course to familiarize students with all major fields in bioinformatics (literature review, computational and biological principles)

**- Mandatory Introductory** course for new graduate students (majority have biology background, 20% have pure computer science background, content is mix of both)

- 2-3 major areas may change with every year, so new weekly outlines/content development is necessary prior to every year’s course

3. **What do you know about the learners who might take your course?** *What do you know about their needs or what they bring with them? What do you know about how they learn? What do you need to find out?*

Usually fresh out of undergrad / variable research experience / variable familiarity with reading methods papers from the field / variable ability to participate in class / not usually apt at self-guided study or identifying their own strengths and weaknesses (/when they are stuck)

**What needs to be found out?** Public speaking ability, identifying and seeking out resources for assistance, ability to break down an argument/question and examine it critically.   
  
4.  **By the end of your course, what do you expect students to know, do, apply, or possess (in terms of attitudes, opinions, beliefs, values)?**

*Another way of approaching this question:* ***Imagine it is two years from now and you've run into one of your students who had taken your class this year. S/he's telling you that the most important thing s/he learned in your class was X. What do you hope the X is?*** *Try to give an immediate response. Write it down.*

* **Appreciating research areas** outside of their own research lab
* Integrating **methodologies** from other bioinformatics specialties in their research
* Being able to identify how to do a thorough **literature review** prior to setting forth on a research question
* Being able to **critically analyse** and take apart a bioinformatics paper
* Being able to explain existing paradigms and research methods with confidence, and communicate their ideas with peers effectively

# **Part B: Big Ideas, Enduring Understandings & Essential Questions**

# *Key Question: What core understandings guide the learning?*

Understanding happens when learners actively make sense of what they are learning through inquiry, application and reflection. Big ideas and essential questions act as scaffolding for learners - from which they build connections between concepts and ideas to support their thinking. Understanding leads to transfer - which refers to the ability to determine when and how to apply what has been learned in different contexts (the ultimate aim of meaningful learning).

# **Big ideas/Enduring Understandings:** What are the linchpin ideas in your course (ie. they hold together the related content knowledge)? What big ideas provide a way for learners to structure new learning and build connections? What understandings will endure as organizing ideas for learners to refer to and relate to as they learn and experiment with new ideas?

# **Essential Questions:** What questions act as a guide to learning in the course and may even form the basis of ongoing inquiry? What questions can you ask your students on a recurring basis to help them gain understanding of the Big Ideas?

*There is a working example of this process from a photography course. The example begins on page 10.*

# ***Key Question: How will I determine priorities?***

How do I translate big ideas and essential questions into priorities for learning? Given the context of my course (including constraints of time, the level of the course, the format etc), **what do I want my learners to be able to know, do, value by the end of the course** (given what I claimed were the “enduring understandings” I have identified)?

The creative process of course design often unleashes many more ideas about why, how and what students might learn than can reasonably be addressed in a 13 week course. For this reason, it is helpful to determine priorities for the course. This framework will help you keep the Big Ideas at the forefront of your design and (from there) consider what learners will need to know, do and be familiar with as they work toward enduring understanding.

*Note: this prioritizing will be done as a mapping activity in the workshop. After the activity, you can begin to populate the priorities chart.*

**Priorities chart**

|  |  |  |
| --- | --- | --- |
| **Big Ideas/Enduring Understandings:**  **Essential Questions:** | **In order to understand Big Idea(s)... learners will need to know, do, apply, value….** | **It will be important for learners to be familiar with…** |

# **Learning Outcomes**

In this section, you will practice taking some of the priorities you identified above (from the column “What do I want my students to know, do, apply and value?”) and translate these into learning outcomes.

Create learning outcomes for your course by considering what learners will gain or learn as a result of participating in your course. What do you intend learners will take away from your course?

* What will they understand?
* What will they know, do/apply?
* What should they be familiar with?
* What might they value differently (or shift their attitudes about) as a result of their work in the course?

Suggested steps for translating the information in your priorities chart into learning outcomes:

1. Revisit the priorities you identified
2. Check for consistency: do the outcomes in the “know, do, apply, value” column correspond to the “big ideas”? That is, if students can “know, do, apply, value” X, does this align with at least one of the big ideas that you hold as important? [if not, revise!]
3. Select one priority, and work on crafting it into a learning outcome. Work on completing this sentence:

***By the end of the course, learners will:***

1. Work on creating learning outcomes for each priority you’ve set. If you have items in Column 3 (be familiar with), creating learning outcomes for those, too.

*Please see the CDI Wiki (bottom of Day 1 Learning Plan: Homework for Day 2) for instructions on where to post up to 4 of your learning outcomes before Day 2 of the CDI.*

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# **Part C: Evidence & Assessment**

# *Key Question: What counts as evidence of understanding?*

Understanding develops as a result of ongoing inquiry, experiment, reflection and re-working over time. It makes sense, then, that evidence of understanding needs to be collected over time, using varied methods, rather than as a single event (Wiggins & McTighe, 2005, p.152). Learners need opportunities to demonstrate understanding in ways that require them to reflect on their thinking and decision making processes - they “why” they did what they did as much as the “how”.

Assessments for understanding are best grounded in learning tasks that are close to the sorts of activities that someone would engage in if they had a professional role in the area of study.

**Evidence of understanding**

* How can the content in this course best be **understood** (by doing, thinking about, discussing, experimenting, iterating, analyzing, etc.).
* What will learners do, apply, create to **demonstrate or express** what they have learned?

**Assessment of understanding**

* How will they be **assessed** and what will they **produce** in order to be assessed (ie. research paper, series of blog posts, collection of images, etc)?
* **What** do you assess?
* **Why** do you assess?
* **Who** else assesses?
  + learners themselves
  + Peers
  + TAs
  + other instructors
  + community (through ratings, etc).

**3-Column Course Planning table**

*You will work in this table for the rest of your plans. Begin by plugging in the Big Ideas, Essential Questions and Learning Outcomes you have already created. Now your task is to work on aligning them with evidence/assessment.* (You may want to choose “landscape” for the orientation of this table, to give you more space to write).

|  |  |  |
| --- | --- | --- |
| **Big Ideas/**  **Enduring Understandings:** | | |
| **Essential Questions:** | | |
| **Learning Outcomes** | **Evidence/Assessment** | **Activities** |
| **By the end of this course, learners will be able to…** | **Learners will know they are meeting**  **course goals when…**  *How will learners* ***demonstrate******or apply*** *this learning?* ***Who*** *will be responsible for* ***assessing/evaluating****? And* ***how****?* | **To help learners make meaning and**  **develop the knowledge, skills, attitudes**  **that will help them be successful,**  **they will engage in…** |
| Identify the difference between a bioinformatics specialty and a set of computational algorithms | **Evidence:**  Define a specialty and an associated set of algorithms  Use an example to illustrate the distinction  Propose use-case scenarios where an algorithm is used across multiple specialties  **Assessment:** |  |
| Outline a bioinformatics based analytical pipeline, integrating key fields and methods | **Evidence:**  Connect methods across specialties to justify the quality of output data  Evaluate the impact of alternative steps on the results/output from described pipeline  **Assessment:** |  |
| Illustrate the integration of bioinformatics specialties in answering biological hypotheses and justify the selection of methods and data types | **Evidence:**  Design an experimental setup to answer proposed hypothesis  Demonstrate domain knowledge and ability to balance drawbacks and benefits of each analytical step  **Assessment:** |  |

# **Part D: Learning Activities and Instructional Strategies**

# *Key Question: What learning activities and resources support learners in constructing and developing their understanding?*

The activities that learners engage in help them make sense of what they are learning and provide an opportunity to integrate what they know with what they are learning. Authentic learning challenges can motivate learners to participate in “real world” contexts.

Careful selection of learning activities is essential in order to support the understandings articulated (in Part B) and prepare learners for the assessments (outlined in Part C).

**Aligning activities for learning with desired learning outcomes and assessment completes the 3 stage backward design process.**

* What activities will **equip** learners to produce their evidence of understanding the central themes of the course?
* How will learners **engage** in questioning, provoking thought, addressing a challenge or analyzing and solving a problem?
* What sort of **learning challenges** are relevant to learners and linked to the big ideas of the course?

*Add to the final column of your 3-Column Course Planning table.*

See the completed course plan from Photography starting on page 13.

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# **Next Steps**

# **Syllabus Prep**

# *Why is this course important to learners? How might the big ideas at the heart of the course relate to their lives? What gets you excited about this course?*

**How would YOU describe your course in a way that inspires (or at least engages) curiosity/interest?** - not the calendar description. Attempt to draft your thinking so far...Why is this course important in the world?

Resource: \* Bart, Mary (2015) [A Learner Centered Syllabus Helps Set the Tone For Learning](http://www.facultyfocus.com/articles/effective-classroom-management/a-learner-centered-syllabus-helps-set-the-tone-for-learning/) - Faculty Focus

**Course Sequence Planning**

You can begin to sequence your course themes, and draft your ideas for in-class and out-of class learning and resources. Add additional rows on this table to match the number of weeks in your course. Note: this table works best as a full page in landscape format.

Here is another visual to help you think about your course sequence (for a blended learning environment) <http://wiki.ubc.ca/File:FG-06.jpg>

|  |  |  |  |
| --- | --- | --- | --- |
| Week’s Theme\* | Out-of-Class Learning | In-Class Learning | Reading /  Resources |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

\* Note: themes should relate to core ideas, key concepts or essential questions that are required for understanding/working with big ideas and achieving learning outcomes.

**Examples & Additional Resources**

**Part B: Big Ideas, Enduring Understandings & Essential Questions**

**Example (Photography)**

*Big idea/Enduring Understanding: “The essence of photography is capturing light.”*

*Essential questions that help learners develop their understanding of this idea:*

*Why does shadow evoke mystery?*

*How do I create shallow depth of field?*

*How can I control the quality of natural lighting?*

Note the criteria and examples in the links below as you consider this aspect of your plan.

**Further Examples**

# **Big ideas:** examples and criteria :<http://bit.ly/1lku7Ba>

**Essential questions**: Examples and criteria: <http://bit.ly/1kHJ3Zt>

**Prioritizing Learning Example (Photography)**

|  |  |  |
| --- | --- | --- |
| Big Ideas:  The *essence of photography is capturing light.*  *Light can be adjusted to reflect mood.* | **In order to understand Big Idea(s)... learners will need to know, do, apply, value….**  *Know about*  *light, golden light, color cast.*  *How to avoid shadows* | **It will be important for learners to be familiar with…**  *Art & artists of photography: Gerhardt Richter; Anselm Keiffer, Ansel Adams, Yousef Karsh, etc and their perspectives* |

**Part C: Aligning Evidence and Assessment example (Photography)**

|  |  |  |
| --- | --- | --- |
| **Learning Outcomes** | **Evidence/Assessment** | **Activities** |
| **By the end of this course, learners will be able to…** | **Learners will know they are meeting**  **course goals when…**  *How will learners* ***demonstrate******or apply*** *this learning?* ***Who*** *will be responsible for* ***assessing/evaluating****? And* ***how****?* | **To help learners make meaning and**  **develop the knowledge, skills, attitudes**  **that will help them be successful,**  **they will engage in…** |
| **Big Ideas/**  **Enduring Understandings:**  *Understand how and why light may be controlled by the photographer.* | ***Evidence: Produce a piece of work for an end of term class show with invited jury****. Learners produce a portfolio of their work, documenting various applications of lighting techniques and reflecting on the impact of their results. One piece will be self selected to enter into class show.*  ***Assessment****: Pieces will be evaluated ongoing through the course in critique circles. In the class show, students will be assessed on their use of light to capture a specific mood. A rubric will be developed by the class for use by the jury.* |  |
| *Explain color of light, and recognize the use of golden light and color cast and the resulting effect on mood.* | ***Evidence****: Analyze found photographic images and conclude what types of light sources were used and infer the intentions of the photographer in creating mood.*  ***Assessment:*** *Weekly (online) posts of at least 2 photo references with a brief write up indicating use of light, and what may be inferred about lighting choices,mood and subject.* ***Peer and instructor evaluated for thoroughness*** *in the analysis and correct reference to technique.* |  |
| *Determine when and why to use a flash.* | ***Evidence****: Produce a series of 10 images taken in different lighting conditions with notes about how decisions were made regarding the use of flash. Include successful and unsuccessful attempts.*  ***Assessment: Weekly critique circles,*** *share 1 photos each week depicting different lighting conditions and decisions and justify your decisions according to the mood you were attempting to create. Integrate* ***feedback from your peers*** *in your portfolio notes. Give feedback to your peers.* |  |
| *Apply techniques for adjusting light (shutter speed, angle, etc) to minimize or enhance shadows on a subject.* | ***Evidence****: Produce a series of 10 images demonstrating the adding/minimizing of shadows and reflect on the resulting effect on mood.*  ***Assessment: Weekly critique circles,*** *share 1 photos each week depicting different lighting adjustments to reduce or enhance shadows on a subject and justify your decisions according to the mood you were attempting to create. Integrate* ***feedback from your peers*** *in your portfolio notes. Give feedback to your peers.* |  |
| *Prepare a portfolio with all required weekly work and notes attached.* | ***Evidence****: Portfolio will include a total of 20 images with attached personal reflection and peer critique.*  ***Assessment:*** *Self /instructor evaluation.**Criteria to be established.* |  |
| *Apply emerging knowledge of the qualities of light that make an impactful photograph (to select a piece for the class show).* | ***Evidence****: Learners will select and prepare a piece for the class show and explain why that piece was selected..*  ***Assessment****: Piece will be* ***assessed by jury*** *on a class created rubric.* |  |
| *Be familiar with the art and artists of photography: Gerhardt Richter; Anselm Keiffer, Ansel Adams, Yousef Karsh, and their perspectives.* | ***Evidence****: Analyze found photographic images and conclude what types of light sources were used and infer the intentions of the photographer in creating mood.*  ***Assessment****: One of the two weekly posted image references will be from a photographic artist referenced on the course reading list.* ***Peer and instructor evaluated for thoroughness*** *in the analysis and correct reference to technique.* |  |
| *Appreciate the role of light in creating an emotional impact in a photograph.* | ***Evidence****: Create an artist statement to accompany the selected piece discussing the rationale for lighting techniques applied in the photograph.*  ***Assessment****: Feedback from peers:* ***critique circles -*** *revise and submit to instructor.* |  |

**Part D: Completed course plan example (Photography)**

The goal in backwards design is to ensure that the learning activities and teaching strategies support the outcomes that you have defined and align with the enduring understandings and essential questions that you have deemed important for your context. In the example below, activities/strategies are highlighted in orange.

|  |  |  |
| --- | --- | --- |
| **Big Ideas/Enduring Understandings:** *The essence of photography is capturing light.[[1]](#footnote-1)*  **Essential Questions:**  *How do I select the right shutter speed?*  *How do I create shallow depth of field?*  *How can I control the quality of natural lighting?* | | |
| *Understand how and why light may be controlled by the photographer.* | *Learners produce a portfolio of their work, documenting various applications of lighting techniques and reflecting on the impact of their results. One piece will be self selected to enter into class show.*  ***End of term class photography show with invited jury*** *of local artists. Pieces will be evaluated on their use of light to capture a specific mood. A rubric will be developed by the class for use by the jury.* | *Attend a photography show or visit an online gallery. What qualities of light transform a photograph and make it art?*  *How do juries evaluate submissions? Review criteria. Build rubric together - think, pair share - each pair contributes a criteria - they are grouped and gaps are addressed - entered into a shared doc for refining.* |
| **Learning Outcomes** | **Evidence/Assessment** | **Activities** |
| *Explain color of light, and recognize the use of golden light and color cast and the resulting effect on mood.* | *Analyze found photographic images and conclude what types of light sources were used and infer the intentions of the photographer in creating mood.*  *Weekly (online) posts of at least 2 photo references with a brief write up indicating use of light, and what may be inferred about lighting choices,mood and subject.* ***Peer and instructor evaluated for thoroughness*** *in the analysis and correct reference to technique.* | *Readings. Bring in photo to discuss as a group. Which photos in your group made an emotional impact? Why? What effect did lighting have on the response?* |
| *Determine when and why to use a flash.* | *Produce a series of 10 images taken in different lighting conditions with notes about how decisions were made regarding the use of flash. Include successful and unsuccessful attempts.*  ***Weekly critique circles,*** *share 1 photos each week depicting different lighting conditions and decisions and justify your decisions according to the mood you were attempting to create. Integrate* ***feedback from your peers*** *in your portfolio notes. Give feedback to your peers.* | *Monthly lighting labs - demo of various approaches to flash - when and when not to use. Practice with cameras.*  *Weekly critique circles. First task: each group contributes to a shared doc. which will serve as Critique Guidelines for the circles. Steps:*  *Research - what is critique process?*  *Discuss - what would be helpful feedback?*  *Contribute - 3 guidelines to shared Critique Guidelines doc.*  *Reading: The value of critique in art. Determine how critique will be handled in peer critique circles. Build group agreements and feedback guidelines for critique circles.*  *Readings. Bring in photo to discuss as a group. Which photos in your group made an emotional impact? Why? What effect did lighting have on the response?* |
| *Apply techniques for adjusting light (shutter speed, angle, etc) to minimize or enhance shadows on a subject.* | *Produce a series of 10 images demonstrating the adding/minimizing of shadows and reflect on the resulting effect on mood. Include successful and unsuccessful attempts.*  ***Weekly critique circles,*** *share 1 photos each week depicting different lighting adjustments to reduce or enhance shadows on a subject and justify your decisions according to the mood you were attempting to create. Integrate* ***feedback from your peers*** *in your portfolio notes. Give feedback to your peers.* | *Critique circles - bring 2 photos to share each week - include successful and unsuccessful attempts. What did you learn from your attempts/experiments? Share your rationale for lighting decisions, techniques applied and discuss results. Integrate feedback in notes.* |
|  |  | *Critique circles - bring 2 photos to share each week - include successful and unsuccessful attempts. What did you learn from your attempts/ experiments? Share your rationale for lighting decisions, techniques applied and discuss results. Integrate feedback in notes.* |
| *Prepare a portfolio with all required weekly work and notes attached.* | *Portfolio will include a total of 20 images with attached personal reflection and peer critique.*  ***Self /instructor evaluation.*** *Criteria to be established.* | *Portfolio working groups in critique circles.* |
| *Apply emerging knowledge of the qualities of light that make an impactful photograph (to select a piece for the class show).* | *Learners will select and prepare a piece for the class show and explain why that piece was selected.*  *Piece will be* ***assessed by jury*** *on a class created rubric.* | *Rubric refined and finalized by class. How does it reflect the understanding implied in overarching “big idea” about photography?* |
| *Be familiar with the art and artists of photography: Gerhardt Richter; Anselm Keiffer, Ansel Adams, Yousef Karsh, and their perspectives.* | *Analyze found photographic images and conclude what types of light sources were used and infer the intentions of the photographer in creating mood.*  *One of the two weekly posted image references will be from a photographic artist referenced on the course reading list.* ***Peer and instructor evaluated for thoroughness*** *in the analysis and correct reference to technique.* | *Explore online photography journals, magazines, etc. Jigsaw activity : each group selects an artist - learns about and disperses to form new groups where each teaches new group about what was learned.* |
| *Appreciate the role of light in creating an emotional impact in a photograph.* | *Create an artists statement to accompany the selected piece discussing the rationale for lighting techniques applied in the photograph.*  *Feedback from peers:* ***critique circles -*** *revise and submit to instructor.* | *What makes a good artist statement? Critique examples. Write draft and review with peer.* |

1. *Note: these big ideas and essential questions are adapted from:* [*Completed course planning doc*](https://iteachu.community.uaf.edu/files/2013/02/UBD_TREE2.pdf) *using UbD methodology: from: U. of Alaska-Fairbanks Faculty Resource:* [*What is Understanding by Design and why should I use it?*](https://iteachu.uaf.edu/online-training/develop-courses/planning-a-course/understanding-by-design/) [↑](#footnote-ref-1)