These learning goals are meant to give you some high-level guidance of the important topics and concepts covered in your pre-readings and in the lectures.

They will be posted at the beginning of each module, but should be considered tentative - they will be updated later in the term as necessary to reflect what is actually covered in the readings / prep / lectures.

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<td><strong>Module 02 – Field Work</strong></td>
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| **Background and Theory** | 2.1 – 2.19:  
  2.1. Lectures W02 to W04  
  2.2. Blomberg et al.  
  2.3. 2.11:  
  2.12. focal points reading  
  2.13. Jordan and Henderson  
  Interaction Analysis  
  2.15. 2.18:  
  2.16. Malone, T.W. How do people organize their desks?  
  2.17. Porcheron et al. Pub Talk |
| 2.1. explain what field work is and how its use in HCI has evolved from its roots; | |
| 2.2. identify and explain the different principles of field work and how they differ from laboratory work | |
| 2.3. be familiar with common critiques of field work | |
| 2.4. ethical concerns in field work, as well as specific ethical concerns for video | |
| 2.5. identify and explain field work variants | |
| 2.6. identify and explain the steps and methods involved in field work | |
|  2.6.1. know the details of the various types and forms for each method | |
|  2.6.2. and as relevant to the discussion, know the pros/cons for given situations, strengths / weaknesses, best practices and common concerns, etc. | |
|  2.6.3. specifically: sampling methods, gaining access, observation, interviews, self-report techniques (e.g., diaries), remote data collection methods (e.g., video), artifact analysis | |
| 2.7. identify and explain the different observational roles a researcher can have | |
| 2.8. identify examples of and explain the nature of qualitative data and how it relates to quantitative data | |
| **Specific methods and practical concerns** | |
| 2.9. know how to prepare and run sessions in the field | |
| 2.10. identify, develop and critique focal points | |
| 2.11. identify and design good vs. bad interview questions | |
| 2.12. explain how video can be use for d 1) data collection 2) analysis | |
|  2.12.1. practical concerns and limitations | |
|  2.12.2. strengths / weaknesses | |
| 2.13. describe and be able to perform an interaction analysis | |
|  2.13.1. explain the benefits of collaborative viewing | |
|  2.13.2. explain the purpose of analytic foci | |
| 2.14. know what to do with the data once you’ve collected it | |
| 2.15. ethics of video | |
|  2.15.1. explain general ethics requirements for HCI researchers, and how these can be mitigated | |
|  2.15.2. explain the ethics requirements at UBC | |
### Presentation and Critique

2.16. describe the methodologies and findings of field work, and be able to identify and explain the strengths / weaknesses:
   - be able to identify methods and critique their use in a given example

2.17. know how to write up a field study
   - common sections and expectations when presenting fieldwork: methodology, procedure, results, discussion, implications for design

### General

2.18. know well the specific examples and discussion points from case studies that we covered in lecture/prep assignments

2.19. be able to critique and justify field work decisions using your knowledge from this module

### Module 03 – Experiments

#### Background and Theory

3.1. explain what experiments are and how they are used in HCI

3.2. identify and explain the different principles of lab work and how it differs from field work

3.3. understand why statistics are used

3.4. understand and know how to apply important concepts from statistics (some of which may be review), including:
   - central tendency (mean, median, mode), and dispersion (variance and standard deviation)
   - samples and populations
   - normal distributions
   - types of variables (independent, dependent, confounding)

3.5. know what an experimental hypothesis is, be able to design hypotheses, and critique them

3.6. know the difference between within- and between-subject comparisons; be able to identify them in an experiment, and justify use in your own experiment design

3.7. know the difference between statistical and practical significance, what is an effect size

3.8. significance levels and types of error (type I and type II), error inflation and relationship to type I errors

3.9. types of validity

#### Specific statistical methods and practical concerns

3.10. know how to design and run an experiment, including two sample experiments, and more complex designs
   - practical concerns and piloting

3.11. know what is meant by, and be able to choose, externally valid tasks

3.12. t-tests
   - different types (e.g., paired, unpaired)
   - when to use it
   - be able to conduct an analysis in R that uses t-tests
     - you do NOT need to know how to calculate a t-test by hand, but you should know the components of the
equation (e.g., degrees of freedom, variance, etc.), and be able to predict their effects on the result
  • be able to interpret R output for t-tests

3.13. analysis of variance (ANOVA)
  • important terminology for ANOVA
  • different types of ANOVA
  • when to use ANOVA, how to choose which ANOVA to use
  • be able to conduct an analysis in R using an ANOVA
  • be able to interpret R output for ANOVA

3.14. interpret and explain results from summarized statistical results and plots
  • identify main / interaction effects in plots, means, etc.
  • draw conclusions / make recommendations based on results

**Presentation**
3.15. know how to report an experiment and how to interpret and summarize experiments in the literature
  • common sections and expectations when writing up an experiment: methodology, procedure, results, discussion, implications for design.
  • how to report and interpret t-tests and ANOVAs

**General**
3.16. know well the specific examples and discussion points from case studies that we cover in lecture/prep assignments

3.17. be able to critique and justify experimental design decisions using your knowledge from this module

**Module 3.5 – Video**
*Note that video for data collection and analysis also discussed extensively in the fieldwork module. Some of that material will be relevant here.*

**Background and Theory**
3.18. Explain how video can be used throughout the design cycle
  • be able to provide examples
  • explain its strengths and weaknesses for each of these uses (i.e. for data collection, analysis, prototyping, presentation, etc.)

**Presentation**
3.19. Describe elements that make a good course project video, and demonstrate these in creation of video for your own team project.

3.18 – 3.19:
  • Lecture w09
Module 4 – Models of the User

4.1. Explain the model human processor, including
  - components and their relationships to one another
    - input/output modalities (vision, hearing, touch/movement – do not need to know specific sensory mechanisms for hearing/touch)
    - memory and cognition
  - characteristics of these components (many explored in more detail in 4.2-4.4)
  - applications and limitations of the model

4.2. Explain theories of performance (Hick’s Law, Fitts’ Law, Power Law of Practice, Steering Law), their basis/origin, applications, and limitations.
  - Will not be asked to do calculations on exam, but must know components of equations and their effects, and interpret any summarized data (especially for Fitts’ Law!)
  - Additional details important for Fitts’ Law, including:
    - Components of the Fitts’ equation and building a Fitts’ Model (methods of finding IP)
    - Shannon formulation vs. original
    - Extension to two dimensions
    - Speed accuracy trade-off, normalization and effective width

4.3. Explain how the human visual system works, including all relevant components, as well as applications and limitations of each of the subtopics discussed.
  - Vision: 3 stage model of the visual system, structure of the human eye, visual perception (brightness, color, size), capabilities and limitations
  - Color: theories of color and luminance perception, common problems with color perception, effective use of color.
  - preattentive processing, how it works, preattentive channels, guidelines for use
  - gestalt laws, original set and additions, applications and guidelines
  - encapsulating complex objects

4.4. Explain the basic model of human memory, including limitations and applications
  - types of memory, how they (are thought to) work, their characteristics and structure, and related phenomenon and explanatory theories (interference, closure, recency effect, theories of forgetting, information retrieval)
  - stage theory of memory
  - guidelines to account for memory in design
  - examples of memory in HCI research

In general: you must be able to apply the various theories, models, etc. to the analysis of an interface(s). This includes being able to identify the relevant theories or models for a given scenario, be able to predicting user performance and/or critique designs and provide a detailed justification.