H3ABioNet

Pan African Bioinformatics Network for H3Africa

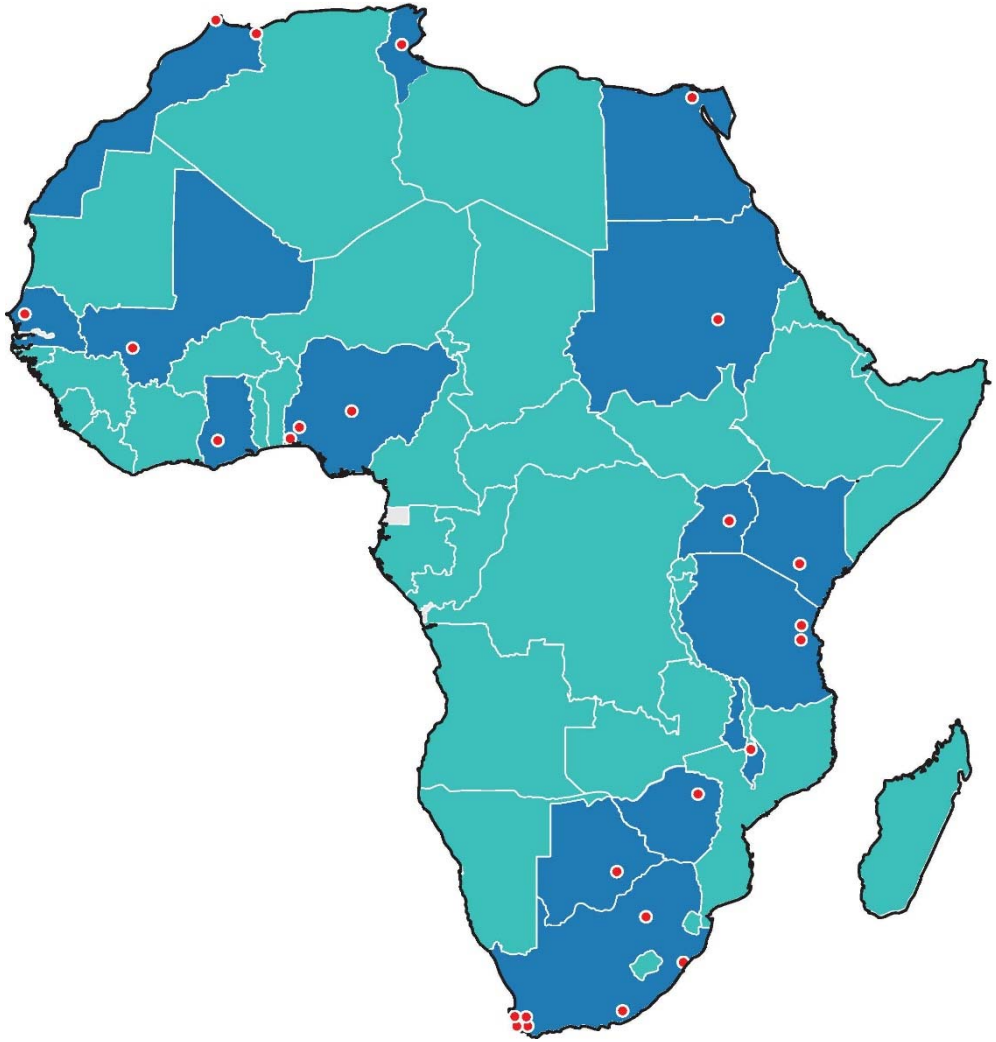
16S rRNA Microbiome Intermediate Bioinformatics Course: Int_BT_2019

Introduction Week

Day 1 Part 1 – Welcome to the course!

H3ABioNet

- Africa-wide network of bioinformatics institutions
- 28 nodes
- Nodes=bioinformatics research groups
- 17 countries
- 16 African countries
- NIH funded
- Part of H3Africa
- Develop bioinformatics capacity in Africa



http://h3abionet.org/home/consortium

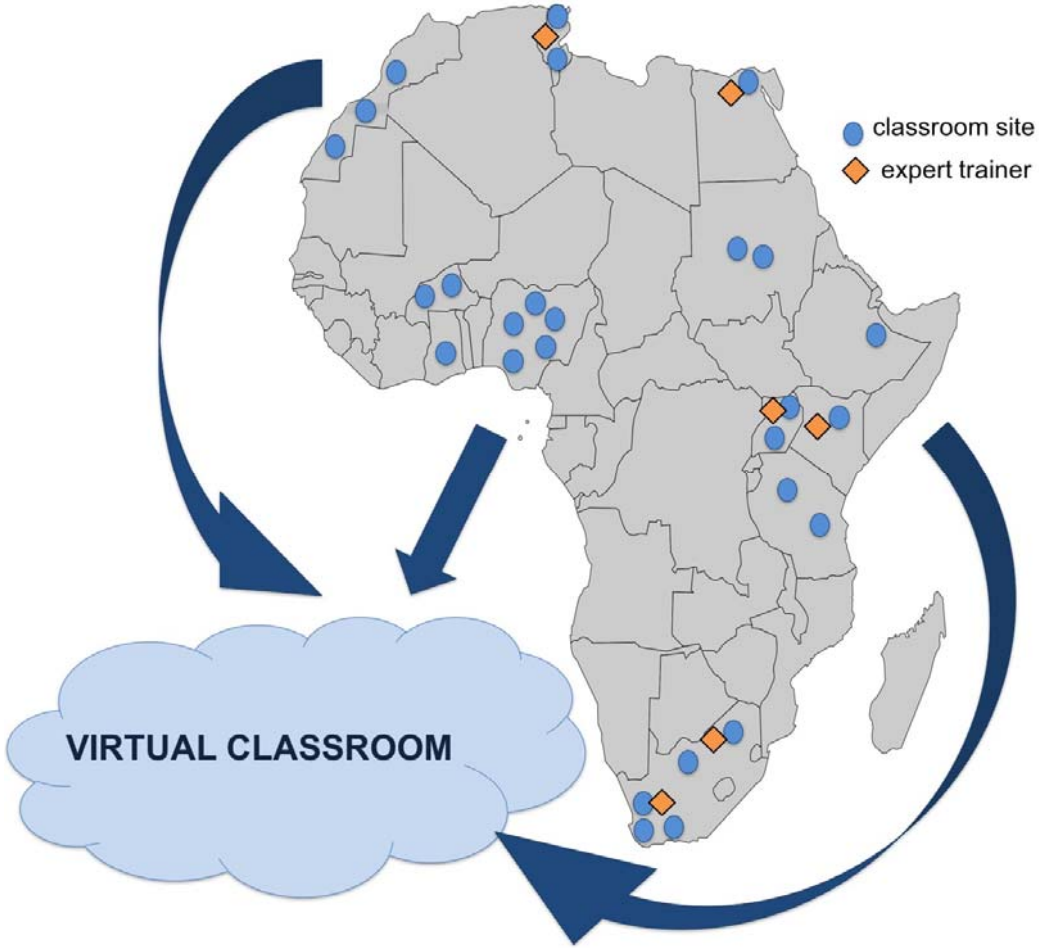
Introduction

- Need for intermediate training
- You are among the first to take the course!

Aims:

- To equip participants with the knowledge and skills to perform analyses on 16S microbiome data.
- To allow participants to gain knowledge and practical experience through theoretical and practical sessions

Int_BT community



By the end of today, you will…

- know the physical location of your training room
- meet and get to know your classroom staff and fellow classmates
- know how the IBT course will run
- be introduced to course website, Vula, and Adobe Connect
- understand the requirements for obtaining the course letter of completion

Logistics

- Follow day plan
- Watch pre-recorded videos
- Videos will contain instructions for activities
- Any questions? Ask via Vula forums

Next

Watch video labeled:

Day 1 Part 2

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Introduction Week

Day 1 Part 2

Meet your classroom staff and classmates

Get to know each other

Activity 1 (10 minutes):

1. Get into pairs (or a group of 3 if there is an odd number of people). Pair with someone that you do not know very well, if possible.
2. Have a chat to get to know each other. Make sure that you find out at least 3-5 things about your partner (5 mins).
3. After 5 minutes of chatting, organise all your chairs into a circle/semi circle so that the whole group is sitting together.
4. Introduce your partner to the rest of the group (for example 'This is… s/he is... s/he enjoys...'). If your group is very small (only 2/3 people), then tell your partner what you remember about them from their description of themselves.
5. Important: classroom staff, get involved!

Next

Watch videos labeled:

Meet the Core Team and Part 3

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Introduction Week

Day 1 Part 3 – Course background

Skills-based curriculum

- **Learning Objective:** knowledge learned without implementation (content covered in the lecture component of contact sessions)

vs.

- **Learning Outcome:** measurable - skills gained (covered in the practical assignment component of contact sessions)
- Important for participants to be able to go out and perform the analyses on their own after the course
- Mapped to specific ISCB competencies alongside trainers

Competencies

Persona: Bioinformatics Scientist				
16S rRNA Microbiome Intermediate Bioinformatics Training_Mapping				
Competency/ies	Bloom's Taxonomy	Knowledge	Skills	Attitudes
General biology	Comprehension	K1, K2, K3	S2, S3	A1,A2
Depth in at least one area of biology (e.g., evolutionary biology, genetics, molecular biology, biochemistry, anatomy, physiology)	Comprehension	K1, K2, K3	S1, S2, S3	A1, A4
Details of the scientific discovery process and of the role of bioinformatics in it	Comprehension	K1, K2, K3, K4, K5	S3, S4, S5	A1, A2, A3, A4
Biological data generation technologies	Comprehension	K1, K2, K3, K4	S1, S2, S3 S4	A1, A2, A3, A4
Statistical, machine learning and data science research methods in the context of molecular biology, genomics, medical, and population genetics research.	Analysis	K1, K2, K3, K4, K5	S1, S2, S3, S4, S5, S6	A1, A2, A3
Data management	Application	K1, K20	S31, S33, S2	A51
Bioinformatics tools and resources and their usage.	Analysis	K1, K4, K5	S1, S2, S3, S4, S5, S6, S7, S8	A1, A2, A3, A4, A5
Fundamentals of computer science theory	Application	K1, K2, K3, K4, K5, K6, K7, K8, K9	S1, S2, S3, S4, S5	A1, A2, A3, A4, A5
Human–computer interaction (HCI)	Analysis	K3, K6	S2	A1
Scripting and programming appropriate to the discipline	Analysis	K1, K2, K4, K5, K6, K8, K9, K10, K11	S37, S1, S38, S39, S40	A1, A2, A3, A4, A5

Modules

Introduction to the command line and R

Gerrit Botha, H3ABioNet, University of Cape Town

Katie Lennard, H3ABioNet, University of Cape Town

Bioinformatics pipeline - The theory

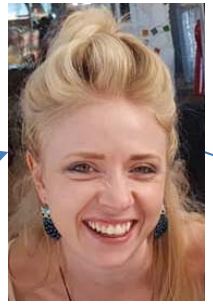
Samson Kilaza, Dar es Salaam Institute of Technology

16S analysis pipeline

Imane Allali, H3ABioNet, University of Cape Town

Downstream analysis in R

Introduction to the microbiome and study design – why 16S



Shantel Claassen-Weitz, University of Cape Town

Sample collection, extraction and library prep for 16S NGS analyses

Next

For more information on course logistics, watch video labelled:

Day 1 Part 4

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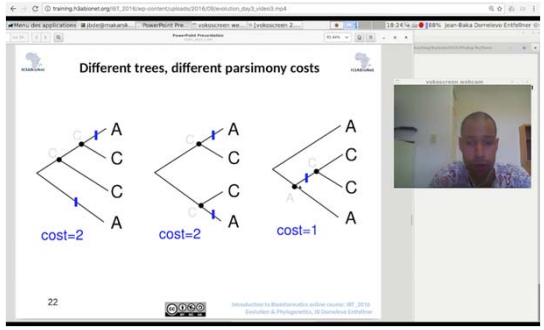
Introduction Week

Day 1 Part 4 – Logistics; how will the course run

Course design

Prerecorded lectures by experts - distance learning



- Videos to become available on the course website at least a few days before each contact session
- Head TA/ sys admin to ensure that the videos have been downloaded ahead of each contact session
- TAs to familiarize themselves with content before the contact session

Virtual classroom

Adobe Connect

Local Classrooms - face to face

- Bi weekly contact sessions
- Local administrative and academic support
- TAs and sys admin needed at every session

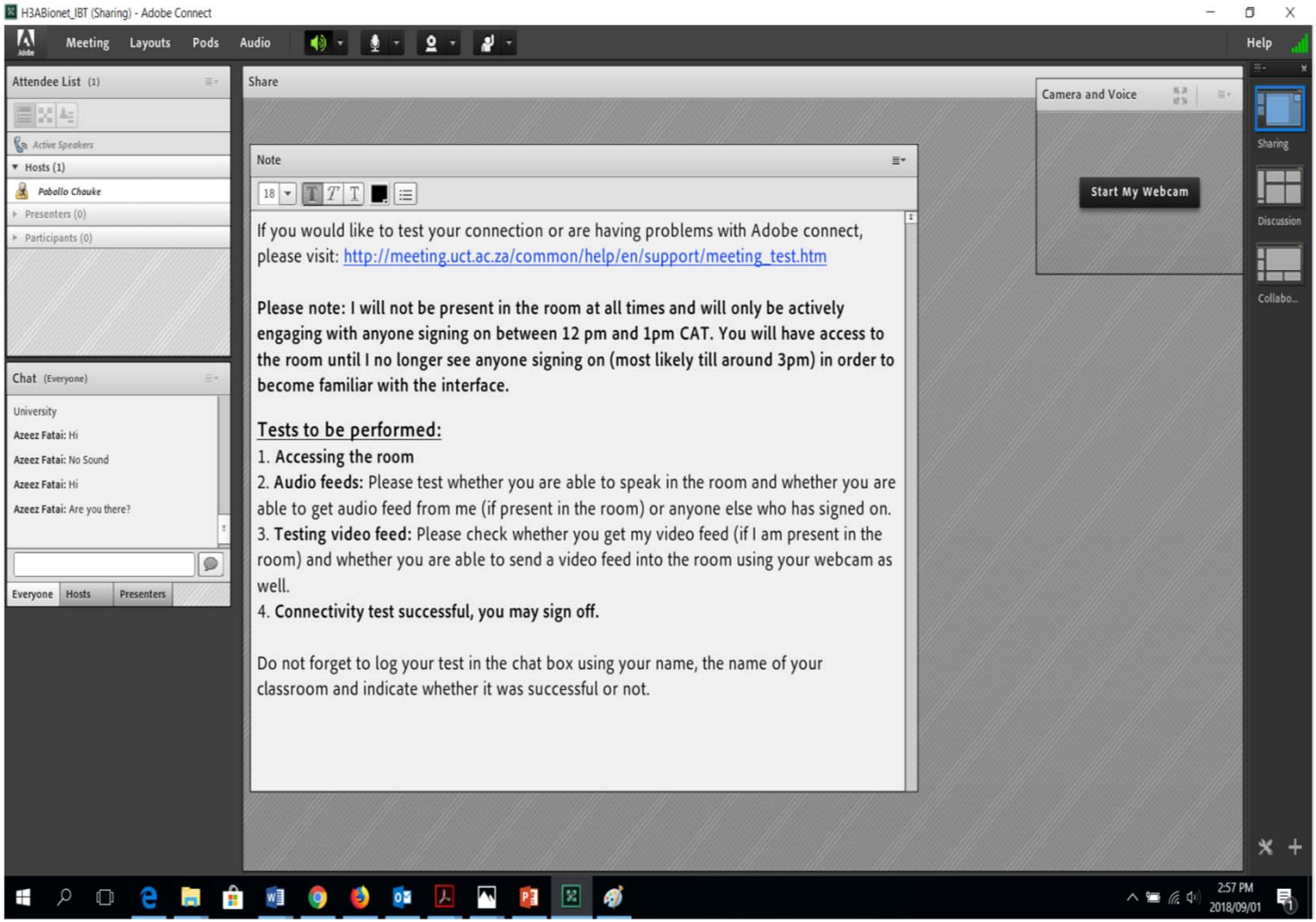
vula

- Practical assignments
- Module assessments
- Question and discussion forums
- Feedback forms

Contact session layout

time	activity
10:20 CAT	Sign in to Adobe Connect
10:30 CAT	Introduction (in Adobe Connect) webcams activated! • Meet the featured classroom
10:40 CAT	Watch lecture recordings (in classroom)
12:30 CAT	break
13:00 CAT	Work through practical assignment (trainer will be available during this time to answer questions via Adobe Connect chat or Vula forums)
14:00 CAT	Ask the trainer • Meet the trainer • Practical session wrap up • Q&A

Adobe Connect



Vula Demo

For participants to pass the course…

In order to pass the course, participants are required to:

- Attend all contact sessions.
- Submit 90% of practical assignments by the relevant hand-in date.
- Submit assessments by the relevant hand-in date and obtain a minimum grade of 60% overall for the assessments.

Consolidation Sessions

- Every few weeks
- A mental ’breather’
- Explore real world relevance of a topic
- Group exercise
- Submit response via Vula forums

https://www.ndtv.com/entertainment/kangana-ranauts-mental-hai-kya-release-date-postponed-because-manikarnika-report-2000633

Next

Now watch the video labelled:
Day 1 Part 5

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Introduction Week

Day 1 Part 5 – Classroom Biographies

Forming a community

- The success of the course will be based on developing a sense of community between classrooms
- Leverage on the fact that you are part of a larger community from diverse backgrounds all with a common interest in teaching and learning bioinformatics
- Easier to do this when you can put faces and a bit of context to your colleagues across the continent

Classroom Biography

- To facilitate this we would like each classroom to write up a short biography about yourselves and your institute and take a photograph of your team
- The short biography should be uploaded to the Vula forums together with the photograph as an attachment
- Each classrooms will be able to view every classrooms biography and photograph

Team Biography

- We have provided instructions and a template for generating the biography and uploading to Vula here:
  - ✓INT_BT_2019 site -> Resources -> Introduction Week-> Introduction week Day 1 Part 5_template - via Vula.docx
  - ✓A single biography should be uploaded for each classroom – elect ONE PARTICIPANT to upload the biography and photograph to Vula on behalf of the classroom

Classroom Biography video - optional

If you would like to, you can create a VIDEO introducing your classroom (similar to 'meet the core team' video)

- We have provided instructions and a powerpoint template for generating the biography video here:
  - ✓INT_BT_2019 site -> Resources -> Introduction Week Day 1_video Biography

Watch video labeled:

Day 1 Part 6

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Introduction week

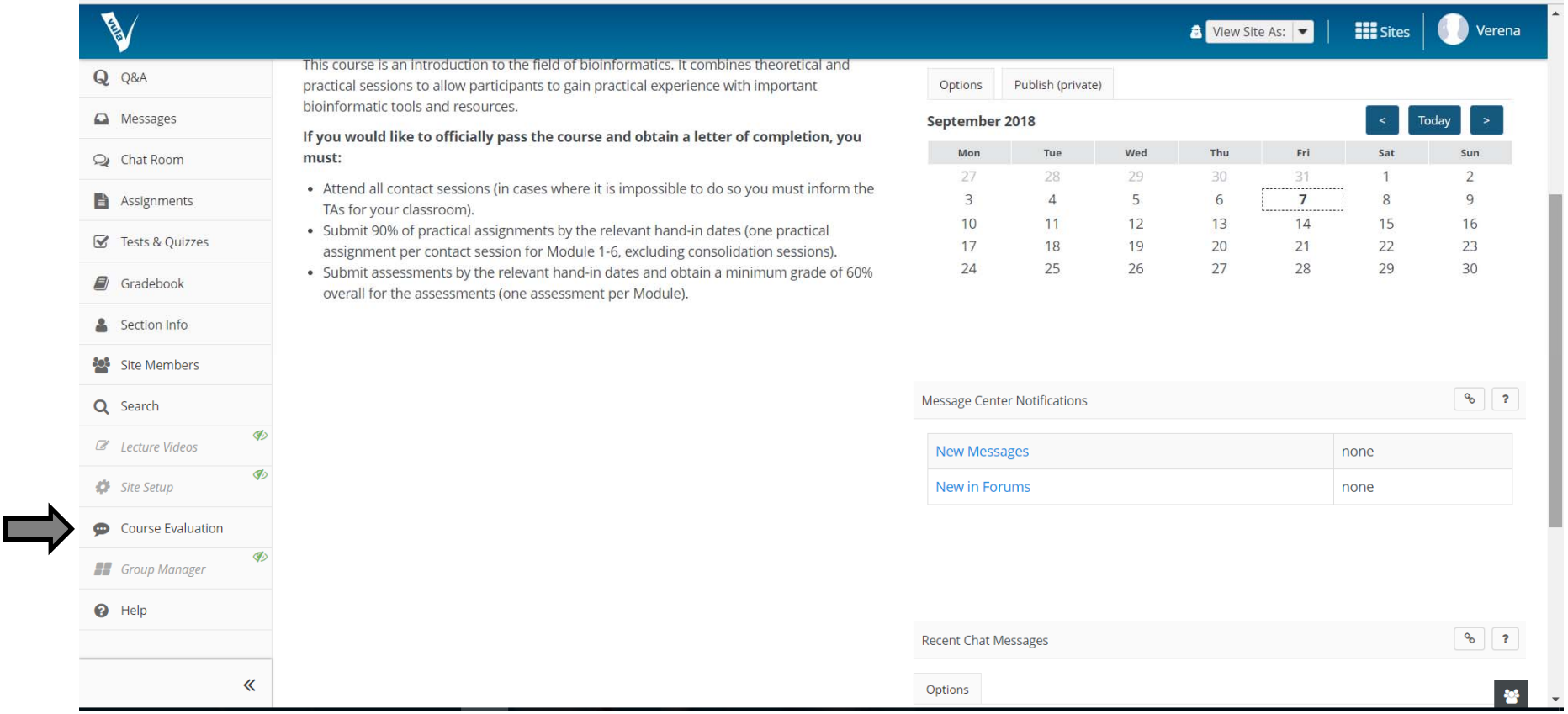
Day 1 Part 6 - Feedback

Feedback

From both IBT staff and IBT participants

- Allows INT_BT team to improve the course
- Allows for self-reflection before and after each module - ‘On a scale from 0 to 5, how confident are you to…’

Feedback



That is all for today

See you next time!