



# BGGN 213

## Course Summary & GitHub Portfolio

Class 20

Barry Grant

UC San Diego

<http://thegrantlab.org/bggn213>

# Today's Menu

- Summary of major learning goals,
- Course discussion and feedback ( [https://board.net/p/bggn213\\_f21](https://board.net/p/bggn213_f21) )
- CAPs evaluation ( [Link](#) )
- Final exam
  - ➔ Test structure, guidelines and rules
  - ➔ Topics and example questions
  - ➔ Exam preparation, discussion and open study
- Polish our GitHub content and publish your own website portfolios

# Today's Menu

- Summary of major learning goals,
- Course discussion and feedback ( [https://board.net/p/bggn213\\_f21](https://board.net/p/bggn213_f21) )
- CAPs evaluation ( [Link](#) )
- Final exam
  - Test structure, guidelines and rules
  - Topics and example questions
  - Exam preparation, discussion and open study
- Polish our GitHub content and publish your own website portfolios

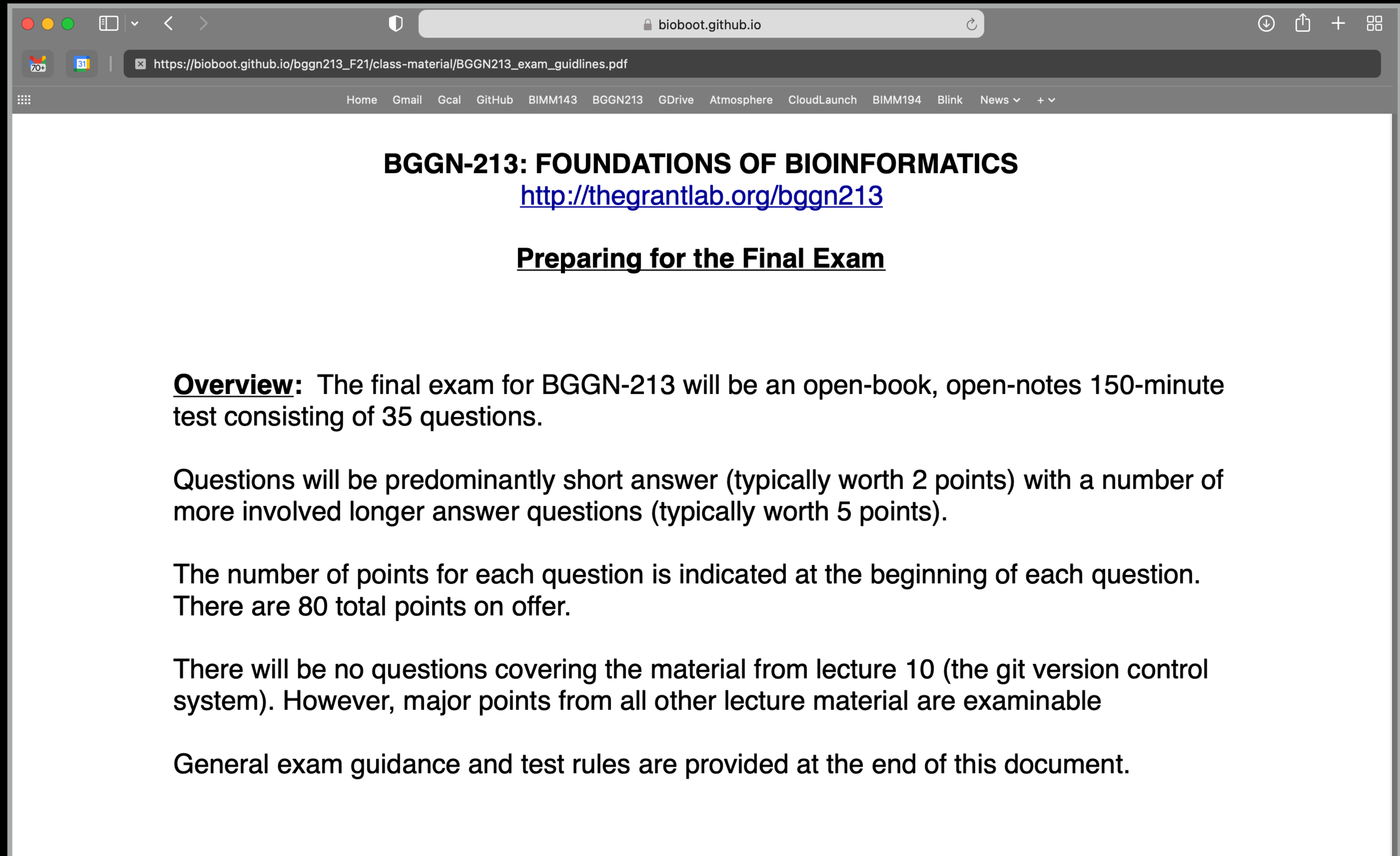


# Today's Menu

- Summary of major learning goals,
- Course discussion and feedback ( [https://board.net/p/bggn213\\_f21](https://board.net/p/bggn213_f21) )
- CAPs evaluation ( [Link](#) )
- Project troubleshooting
  - Test structure, guidelines and rules
  - Topics and example questions
  - Exam preparation, discussion and open study
- Polish our GitHub content and publish your own website portfolios



[https://bioboot.github.io/bggn213\\_F21/class-material/BGGN213\\_exam\\_guidelines.pdf](https://bioboot.github.io/bggn213_F21/class-material/BGGN213_exam_guidelines.pdf)



The image shows a screenshot of a web browser window. The address bar contains the URL [https://bioboot.github.io/bggn213\\_F21/class-material/BGGN213\\_exam\\_guidelines.pdf](https://bioboot.github.io/bggn213_F21/class-material/BGGN213_exam_guidelines.pdf). The browser's navigation bar includes links for Home, Gmail, Gcal, GitHub, BIMM143, BGGN213, GDrive, Atmosphere, CloudLaunch, BIMM194, Blink, and News. The main content area of the page is white and contains the following text:

**BGGN-213: FOUNDATIONS OF BIOINFORMATICS**  
<http://thegrantlab.org/bggn213>

**Preparing for the Final Exam**

**Overview:** The final exam for BGGN-213 will be an open-book, open-notes 150-minute test consisting of 35 questions.

Questions will be predominantly short answer (typically worth 2 points) with a number of more involved longer answer questions (typically worth 5 points).

The number of points for each question is indicated at the beginning of each question. There are 80 total points on offer.

There will be no questions covering the material from lecture 10 (the git version control system). However, major points from all other lecture material are examinable

General exam guidance and test rules are provided at the end of this document.

- Q1.** Did you enjoy this course? (Rank in relation to others you have experienced at UCSD)?
- Q2.** Should this course be offered again?
- Q3.** If so what changes would you recommend for this course? (e.g. more/less DataCamp & Projects)
- Q4.** Was the course effectively organized (lecture and lab material online vs handout or TritonEd site)?
- Q5.** What advice would you give to another student who is considering taking this course?
- Q6.** Considering both the limitations and possibilities of the subject matter and the course, how would you rate the overall effectiveness of this course and instructor?
- Q7.** Do you agree or disagree - The course developed my abilities and skills for the subject?
- Q8.** On average, how many hours per week have you spent on this course, including attending classes, doing homework's and assignments?
- Q9.** Any other comments you would like to share?

**EtherPad Version:** [https://board.net/p/bgggn213\\_f21](https://board.net/p/bgggn213_f21)

**Form Version:** <https://tinyurl.com/bgggn213-summary>

**Thank you very much!**

Announcement!

# Bonus:

# Bioinformatics & Genomics in Industry

## Live Stream Video

Enjoy a set of short open ended guest lectures from leading genomic scientists at **Illumina Inc.**, **Synthetic Genomics Inc.**, and the **La Jolla Institute for Allergy and Immunology**. Feel free to contact these scientists for networking and to have your questions about industry careers in Bioinformatics and Genomics answered.



**Bonus:**


GitHub Spit & Polish

bioboot.github.io/bimm143-1/

Home Gmail Gcal Bitbucket GitHub BIMM143\_F18 BGGN213\_S18 BIMM-194 GDocs Disqus Blink News Atmosphere Galaxy + MMTF

bioboot/bimm143\_serina\_f18: Serina's Fall 2018 class repository fork Serina's BIMM 143 Class Repository | Serina's Bioinformatics Class (BIMM143,... Bioinformatics Class BIMM-143 | Introduction to Bioinformatics (BIMM143)

## Introduction to Bioinformatics



A demo site of students cool class web site

[View the Project on GitHub](#)  
bioboot/bimm143-1

This project is maintained by [bioboot](#)

Hosted on GitHub Pages — Theme by [orderedlist](#)

## Bioinformatics Class

This is my repository for my Bioinformatics class from UC San Diego in S18.

### Index of Material

*Introductory Material: Working With R*

Class 5 - [Basic Data Exploration and Visualization in R HTML, MD, Rmd](#)

Class 6 - [Creating R Functions](#)

Class 7 - [R Packages, working with CRAN, and working with Bioconductor](#)

*Using R and Other Tools for Bioinformatics Analysis*

Class 8 - [An Introduction to Machine Learning \(Heirarchical Clustering\)](#)

Class 9 - [Analyzing High Dimensional Datasets and Unsupervised Learning](#)

Class 11 - [Structural Bioinformatics: Analyzing Protein Structure and Function](#)

Class 12 - [Drug Discovery: Techniques and Analysis](#)

Class 13 - [Genome Informatics and High Throughput Sequencing \(NGS, RNA-Seq, and FastQC\)](#)

Class 14 - [Transcriptomics and RNA-Seq Analysis](#)

In your web browser navigate to your GitHub class repository < <https://github.com/> >

**Side-note:**

To find the link to your GitHub repository from RStudio, open one of your past class projects and in the terminal type:

```
git remote -v
```

The screenshot shows a web browser window displaying a GitHub repository page. The address bar shows the URL [github.com/bioboot/bimm143\\_fall18](https://github.com/bioboot/bimm143_fall18). The page header includes navigation links for Home, Gmail, Gcal, Bitbucket, GitHub, BIMM143\_F18, BGGN213\_S18, BIMM-194, GDocs, Disqus, Blink, News, Atmosphere, Galaxy, and MMTF. The repository name is **bioboot / bimm143\_fall18**. The page shows 1 watch, 0 stars, and 0 forks. The repository description is "My class repo for bimm143 at UCSD". The repository statistics show 22 commits, 1 branch, 0 releases, and 1 contributor. The current branch is **master**. There are buttons for "New pull request", "Create new file", "Upload files", "Find file", and "Clone or download". The commit history shows the latest commit by **bioboot** with the message "Add class18" 7 minutes ago, and two previous commits: "Add class 5" and "add class08", both from a month ago.

Or for a given GitHub tracked file click **GIT** icon and **"VIEW on GITHUB"**

The screenshot shows the RStudio interface with a context menu open over a file named "lecture18part2example.Rmd". The menu options are:

- Diff "lecture18part2example.Rmd" (^⌘D)
- Log of "lecture18part2example.Rmd"
- Revert "lecture18part2example.Rmd"...
- View "lecture18part2example.Rmd" on GitHub** (highlighted with a red box)
- Blame "lecture18part2example.Rmd" on GitHub
- Commit... (^⌘M)
- Pull Branches
- Push Branch
- History
- Project Setup...

The background shows the R Markdown editor with the following code:

```
70 {r}
71 ## Output a FASTA file for further
72 write.fasta(seqs=store.seqs, ids=
73
74
75
76
77 ## Sidenote: Input sequence setup
78
79 For refernce only, here we use the UniProt KRas oncogene sequence
  (http://www.uniprot.org/uniprot/P01116) as an example input and make a
```

The console output shows the following FASTA sequence:

```
~/Desktop/courses/bgg213_W19/bgg213_github/class18/
R213V "Y" "L" "D" "D" "R" "N" "T" "F" "V" "H" "S" "V" "V"
D259V "I" "L" "T" "I" "I" "T" "L" "E" "V" "_" "_" "_" "_"
      [,14] [,15] [,16] [,17]
D41L  "S" "P" "D" "D"
R65W  "A" "P" "P" "V"
R213V "V" "P" "Y" "E"
D259V "_" "_" "_" "_"
>
```

The Files pane on the right shows the project structure:

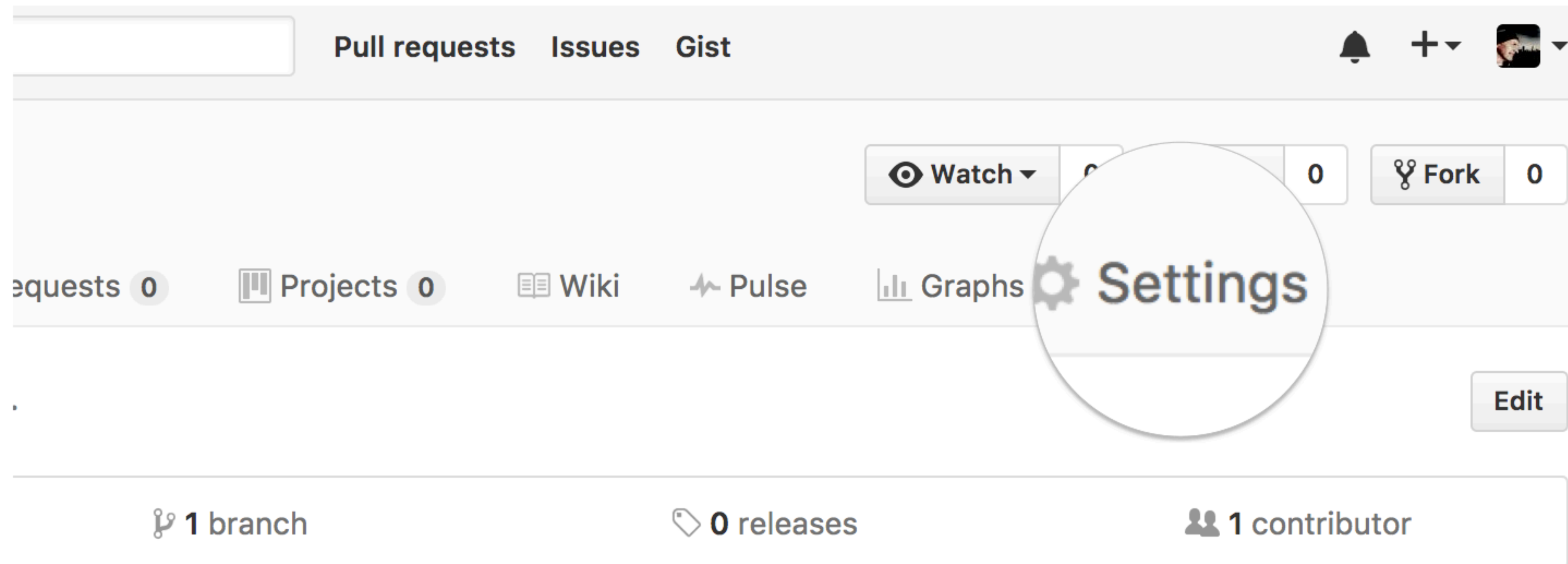
- class18.Rproj
- aln.fa
- lecture18\_part2\_exa...
- subsequences.fa
- kras-sequences.fa
- lecture18\_part2\_exa...
- seqs.fasta

1

# Repository Settings

Head over to your **GitHub** class repository (where you are “pushing” all your class work)

Click on the **Settings** tab.



## Theme chooser

Scroll down to the **GitHub Pages** section. ~~Press **Choose a theme.**~~  
And set the **Source** to "main branch"

### GitHub Pages

[GitHub Pages](#) is designed to host your personal, organization, or project pages from a GitHub repository.

### Source

GitHub Pages is currently disabled. Select a source below to enable GitHub Pages for this repository. [Learn more.](#)

None ▾

Save

### Theme chooser

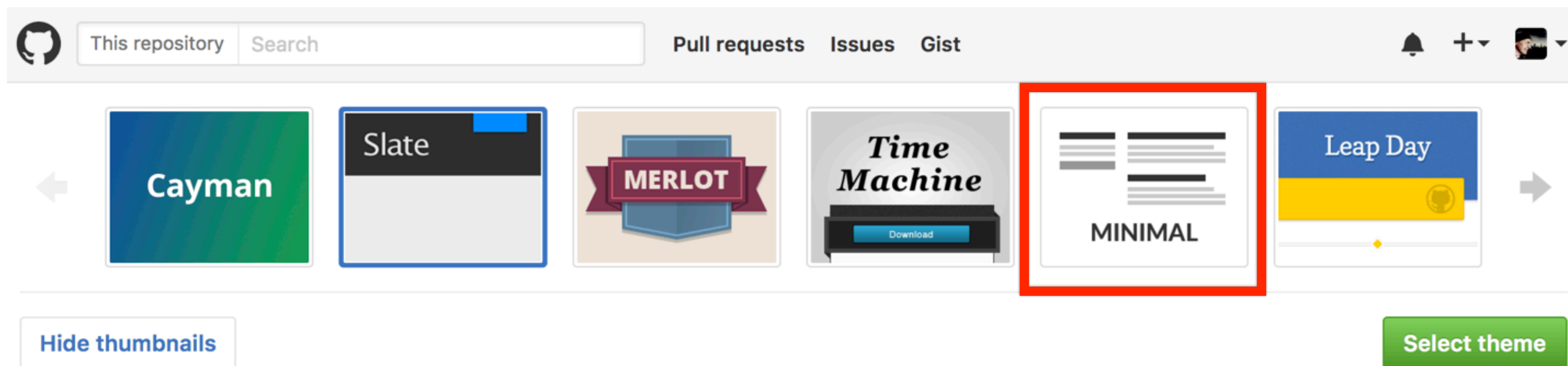
Select a theme to build your site with a Jekyll theme using the `master branch`. [Learn more.](#)

Choose a theme

## Pick a theme

Choose one of the themes from the carousel at the top.

When you're done, click **Select theme** on the right.



The screenshot shows the GitHub theme selection interface. At the top, there is a navigation bar with the GitHub logo, a search bar labeled "This repository", and links for "Pull requests", "Issues", and "Gist". On the right side of the navigation bar are icons for notifications, a plus sign, and a user profile. Below the navigation bar is a carousel of theme thumbnails. The thumbnails are: "Cayman" (blue and green gradient), "Slate" (black and white), "MERLOT" (blue and red), "Time Machine" (grey with a printer icon), "MINIMAL" (white with black text, highlighted with a red border), and "Leap Day" (blue and yellow). Below the carousel are two buttons: "Hide thumbnails" on the left and "Select theme" on the right.

## Slate theme

Slate is a theme for GitHub Pages.

[View on GitHub](#)

## Side-note:

Scroll down again to the **GitHub Pages** section to find the link to your new website.  
Open this link in a **New Tab** of your browser:

### GitHub Pages

GitHub Pages is designed to host your personal, organization, or project pages from a GitHub repository.

Your site is ready to be published at [https://bioboot.github.io/bimm143\\_serina\\_f18/](https://bioboot.github.io/bimm143_serina_f18/).

#### Source

Your GitHub Pages site is currently being built from the master branch. [Learn more.](#)

master branch ▾

Save

#### Theme Chooser

Select a theme to publish your site with a Jekyll theme. [Learn more.](#)

Your site is currently using the Minimal theme.

Change theme



# Edit content

Back on the repository main page use the [GitHub](#) online editor to add content.  
In particular, add links to each classes .MD file

The screenshot shows the GitHub repository editor interface for the file `README.md` in the repository `jldec / new-pages-site`. The repository has 0 Watchers, 0 Stars, and 0 Forks. The editor is currently in the "Edit file" mode, with a "Preview changes" tab also visible. The code in the editor is as follows:

```
1 ## Welcome to GitHub Pages
2
3 You can use the [editor on GitHub](https://github.com/jldec/new-pages-site/edit/master/README.md) to maintain and preview the content
  for your website in Markdown files.
4
5 Whenever you commit to this repository, GitHub Pages will run [Jekyll](https://jekyllrb.com/) to rebuild the pages in your site, from
  the content in your Markdown files.
6
7 ### Markdown
8
9 Markdown is a lightweight and easy-to-use syntax for styling your writing. It includes conventions for
10
11 ```markdown
12 Syntax highlighted code block
13
14 # Header 1
```

# Commit

Enter a commit comment and click on **Commit changes** below the editor.

```
35   ### Support or Contact
```

```
36
```

```
37   Having trouble with Pages? Check out our \[documentation\]\(https://help.github.com/categories/gi  
38   https://github.com/contact) and we'll help you sort it out.
```

```
38
```



## Commit changes

Add content to new pages site|

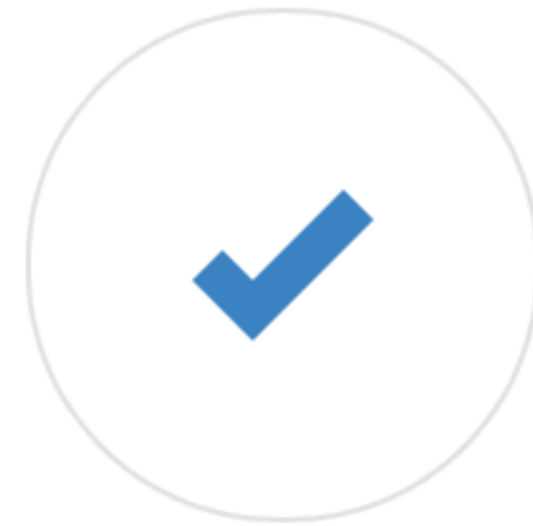
Add an optional extended description...

Commit directly to the `master` branch.

6

...and you're done!

Fire up a browser and go to **<http://username.github.io/repository>**.



The screenshot shows a web browser displaying a GitHub repository page. The browser's address bar shows the URL `bioboot.github.io/bimm143-1/`. The page has a navigation bar with links to Home, Gmail, Gcal, Bitbucket, GitHub, BIMM143\_F18, BGGN213\_S18, BIMM-194, GDocs, Disqus, Blink, News, Atmosphere, Galaxy, and MMTF. The repository name is `bioboot/bimm143_serina_f18: Serina's Fall 2018 class repository fork`. The main content area is divided into two columns. The left column features a large blue heading **Introduction to Bioinformatics**, a logo of a DNA double helix with a magnifying glass over the binary code `101` and `110`, and a paragraph: "A demo site of students cool class web site". Below this is a link [View the Project on GitHub](#) with the repository path `bioboot/bimm143-1`. It also states "This project is maintained by [bioboot](#)" and "Hosted on GitHub Pages — Theme by [orderedlist](#)". The right column has a heading **Bioinformatics Class**, a paragraph: "This is my repository for my Bioinformatics class from UC San Diego in S18.", and a heading **Index of Material**. Below this is a list of class topics: *Introductory Material: Working With R*, Class 5 - [Basic Data Exploration and Visualization in R HTML, MD, Rmd](#), Class 6 - [Creating R Functions](#), Class 7 - [R Packages, working with CRAN, and working with Bioconductor](#), *Using R and Other Tools for Bioinformatics Analysis*, Class 8 - [An Introduction to Machine Learning \(Heirarchical Clustering\)](#), Class 9 - [Analyzing High Dimensional Datasets and Unsupervised Learning](#), Class 11 - [Structural Bioinformatics: Analyzing Protein Structure and Function](#), Class 12 - [Drug Discovery: Techniques and Analysis](#), Class 13 - [Genome Informatics and High Throughput Sequencing \(NGS, RNA-Seq, and FastQC\)](#), and Class 14 - [Transcriptomics and RNA-Seq Analysis](#).


Here I: **(1)** forked Serina's Repo, **(2)** Chose the "minimal" theme, **(3)** Edited `_config.yml` (adding logo and title)

bioboot / **bimm143\_serina\_f18**  
forked from serinahuang/bimm143




Unwatch 1 Star 0 Fork 1

Code Pull requests 0 Projects 0 Wiki Insights Settings

Branch: master **bimm143\_serina\_f18 / \_config.yml** Find file Copy path

 **bioboot** Update \_config.yml 3b72493 just now

1 contributor


4 lines (3 sloc) | 151 Bytes Raw Blame History   

```
1 theme: jekyll-theme-minimal
2 logo: https://bioboot.github.io/bimm143_F18/assets/img/logo.png
3 title: Serina's Bioinformatics Class (BIMM143, Fall 2018)
```

Here I: (1) Chose the “minimal” theme, (3) Edited \_config.yml (adding logo and title), (4) Edited README.md

<https://bioboot.github.io/bggn213/>

## Foundations of Bioinformatics Class S18



A demo site of students cool class work portfolio

[View the Project on GitHub](#)  
bioboot/bggn213

## BGGN213

This is my classwork from BGGN213 at UC San Diego (S18). The main class homepage is [here](#)

- **Class05:** [Data Visualization in R](#) (for other self contained formats see [HTML](#), [MD](#) and [R](#)).
- [Class06: Why, when and how of writing your own R functions](#)
- [Class07: Bioinformatics R packages from CRAN and BioConductor](#)
- **Class08:** [Machine Learning for Bioinformatics 1](#)
- **Class09:** [Machine learning project](#)
- Etc.

Here I: (1) Chose the “minimal” theme, (3) Edited `_config.yml` (adding logo and title), (4) Edited `README.md`


[https://bioboot.github.io/tmp\\_test/](https://bioboot.github.io/tmp_test/)

bioboot.github.io/bimm143-1/

Home Gmail Gcal Bitbucket GitHub BIMM143\_F18 BGGN213\_S18 BIMM-194 GDocs Disqus Blink News Atmosphere Galaxy + MMTF

bioboot/bimm143\_serina\_f18: Serina's Fall 2018 class repository fork Serina's BIMM 143 Class Repository | Serina's Bioinformatics Class (BIMM143,... Bioinformatics Class BIMM-143 | Introduction to Bioinformatics (BIMM143)

# Introduction to Bioinformatics



A demo site of students cool class web site

[View the Project on GitHub](#)  
bioboot/bimm143-1

This project is maintained by [bioboot](#)

Hosted on GitHub Pages — Theme by [orderedlist](#)

## Bioinformatics Class

This is my repository for my Bioinformatics class from UC San Diego in S18.

### Index of Material

*Introductory Material: Working With R*

Class 5 - [Basic Data Exploration and Visualization in R HTML, MD, Rmd](#)

Class 6 - [Creating R Functions](#)

Class 7 - [R Packages, working with CRAN, and working with Bioconductor](#)

*Using R and Other Tools for Bioinformatics Analysis*

Class 8 - [An Introduction to Machine Learning \(Heirarchical Clustering\)](#)

Class 9 - [Analyzing High Dimensional Datasets and Unsupervised Learning](#)

Class 11 - [Structural Bioinformatics: Analyzing Protein Structure and Function](#)

Class 12 - [Drug Discovery: Techniques and Analysis](#)

Class 13 - [Genome Informatics and High Throughput Sequencing \(NGS, RNA-Seq, and FastQC\)](#)

Class 14 - [Transcriptomics and RNA-Seq Analysis](#)

Here I: (1) Chose the “minimal” theme, (3) Edited `_config.yml` (adding logo and title), (4) Edited `README.md`

bioboot / tmp\_test

Unwatch 1 Star 0 Fork 0

Code Issues 0 Pull requests 0 Projects 0 Wiki Insights Settings

tmp\_test / README.md or cancel

Edit file Preview changes Spaces 2 Soft wrap

```
1 # BIMM143 Classwork
2
3 This is a store of my class-work for [BIMM143 Winter 2019](https://bioboot.github.io/bimm143_W19/) at UC San Diego.
4
5 ## Content
6 - Class05: [R fundamentals](https://github.com/bioboot/tmp_test/blob/master/class05/class05.md)
7 - Class06: [R graphics]()
8 - Class07: R Functions
9 - Class08: R packages from CRAN, Bioconductor and GitHub
10 - Class09: Introduction to machine learning
11 - Class10: Some thing else
12 - Class11: (Structural Bioinformatics)(https://github.com/bioboot/tmp_test/blob/master/class11/class11.md)
13 - Class12: etc. etc.
14
```

Here I: (1) Chose the “minimal” theme, (3) Edited `_config.yml` (adding logo and title), (4) Edited `README.md`




bioboot.github.io/bimm143-1/

Home Gmail Gcal Bitbucket GitHub BIMM143\_F18 BGGN213\_S18 BIMM-194 GDocs Disqus Blink News Atmosphere Galaxy + MMTF

bioboot/bimm143\_serina\_f18: Serina's Fall 2018 class repository fork Serina's BIMM 143 Class Repository | Serina's Bioinformatics Class (BIMM143,... Bioinformatics Class BIMM-143 | Introduction to Bioinformatics (BIMM143)

# Introduction to Bioinformatics



A demo site of students cool class web site

[View the Project on GitHub](#)  
bioboot/bimm143-1

This project is maintained by [bioboot](#)

Hosted on GitHub Pages — Theme by [orderedlist](#)

## Bioinformatics Class

This is my repository for my Bioinformatics class from UC San Diego in S18.

### Index of Material

*Introductory Material: Working With R*

Class 5 - [Basic Data Exploration and Visualization in R HTML, MD, Rmd](#)

Class 6 - [Creating R Functions](#)

Class 7 - [R Packages, working with CRAN, and working with Bioconductor](#)

*Using R and Other Tools for Bioinformatics Analysis*

Class 8 - [An Introduction to Machine Learning \(Heirarchical Clustering\)](#)

Class 9 - [Analyzing High Dimensional Datasets and Unsupervised Learning](#)

Class 11 - [Structural Bioinformatics: Analyzing Protein Structure and Function](#)

Class 12 - [Drug Discovery: Techniques and Analysis](#)

Class 13 - [Genome Informatics and High Throughput Sequencing \(NGS, RNA-Seq, and FastQC\)](#)

Class 14 - [Transcriptomics and RNA-Seq Analysis](#)

Here I: (1) forked Serina's Repo, (2) Chose the "minimal" theme, (3) Edited `_config.yml` (adding logo and title)

# Thank you very much!

Please do fill out your CAPs evaluation ( [Link!](#) ) if you get a change.  
It is important to the courses we offer in the future and how we teach them!

# Thank you very much!

Please do fill out your CAPs evaluation ( [Link!](#) ) if you get a chance.  
It is important to the courses we offer in the future and how we teach them!

**Post to GradeScope your [GitHub Pages](#) portfolio [URL](#) with all classes by  
this Friday and receive another 5pts credit!**

# Going Further With DataCamp

[https://bioboot.github.io/bimm143\\_F19/class-material/datacamp\\_extras.pdf](https://bioboot.github.io/bimm143_F19/class-material/datacamp_extras.pdf)

The screenshot shows a web browser window with the URL [www.datacamp.com/tracks/custom-bioinformatics-extension](https://www.datacamp.com/tracks/custom-bioinformatics-extension). The page features a dark blue header with a search bar containing the text "What would you like to learn t", navigation links for "Learn", "Practice", "Projects", "Pricing", and "My Classes", and a user profile icon with "3,050 XP". Below the header, the page is titled "CUSTOM TRACK Bioinformatics Extension". A paragraph of text reads: "Barry's suggested DataCamp courses for delving deeper into R, Git, the Shell, data visualization, and Bioinformatics data analysis generally. Please do reach out if you encounter problems. Happy DataCamping!". A yellow "Enroll" button is positioned below this text. To the right, there is a square graphic with a DNA double helix and a magnifying glass over binary code "101" and "110". At the bottom of the track section, a horizontal list of tags includes "R Language", "Shell", "Git", "Spreadsheets", "111 hours", and "26 Courses".

The course card features a blue icon with a terminal prompt ">\_" at the top. The title is "Introduction to Shell for Data Science". The description below reads: "The Unix command line helps users combine existing programs in new ways, automate repetitive tasks, and run programs ...".

The "INSTRUCTORS" section lists two individuals: "Greg Wilson" (Co-founder of Software Carpentry) and "Jonathan Cornelissen". Each name is accompanied by a small circular profile picture.

# Thank you very much!

Please do fill out your CAPs evaluation ( [Link!](#) ) if you get a chance.  
It is important to the courses we offer in the future and how we teach them!

**Post to GradeScope your [GitHub Pages](#) portfolio [URL](#) with all classes by  
this Friday and receive another 5pts credit!**

Announcement!

# Bonus:

# Bioinformatics & Genomics in Industry

## Live Stream Video

Enjoy a set of short open ended guest lectures from leading genomic scientists at **Illumina Inc.**, **Synthetic Genomics Inc.**, and the **La Jolla Institute for Allergy and Immunology**. Feel free to contact these scientists for networking and to have your questions about industry careers in Bioinformatics and Genomics answered.