

Course Crafters

...

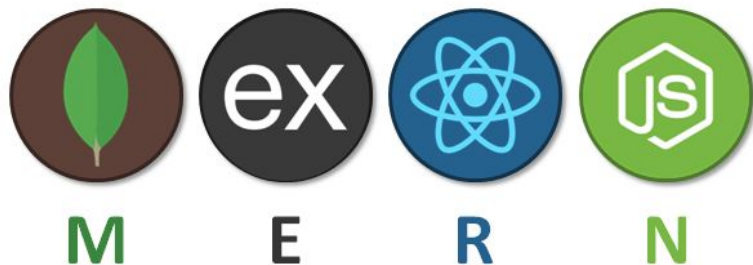
Eric Uehling and Mark Fuentes

<https://github.com/uehlingeric/CourseCrafters>

What is Course Crafters?

- Target Users: Virginia Tech students planning course enrollments
- Purpose: Facilitating informed decision-making in course selection
- Data Access: Historical data on departments, courses, and instructors
- Time Span: Comprehensive data coverage from 2018 to 2023
- Key Features:
 - GPA Trends Analysis: Insight into academic performance over time
 - Enrollment Numbers: Understanding course popularity and availability
 - Withdrawal Rates: Gauging course difficulty and student satisfaction
- Objective: Simplifying course selection with a data-driven approach
- User Benefits: Tailored course planning aligned with academic goals

Our Tech Stack:



MongoDB:

- NoSQL Database
- Stores application data with flexibility in data structure. Allows for efficient data retrieval and management.

Express.js:

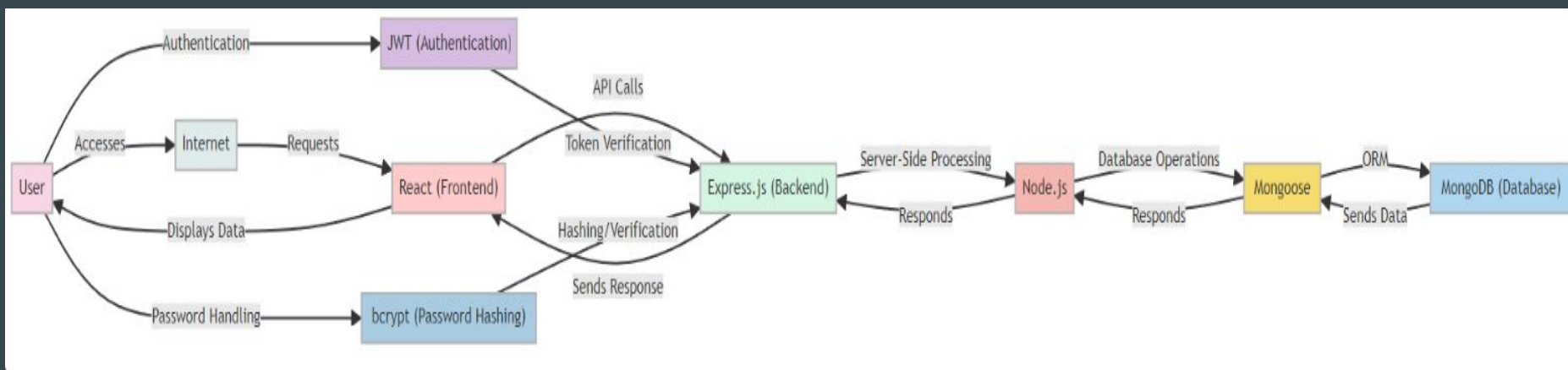
- Web Application Framework for Node.js
- Simplifies the creation of server-side logic and routes. Manages interactions between the frontend and the database.

React:

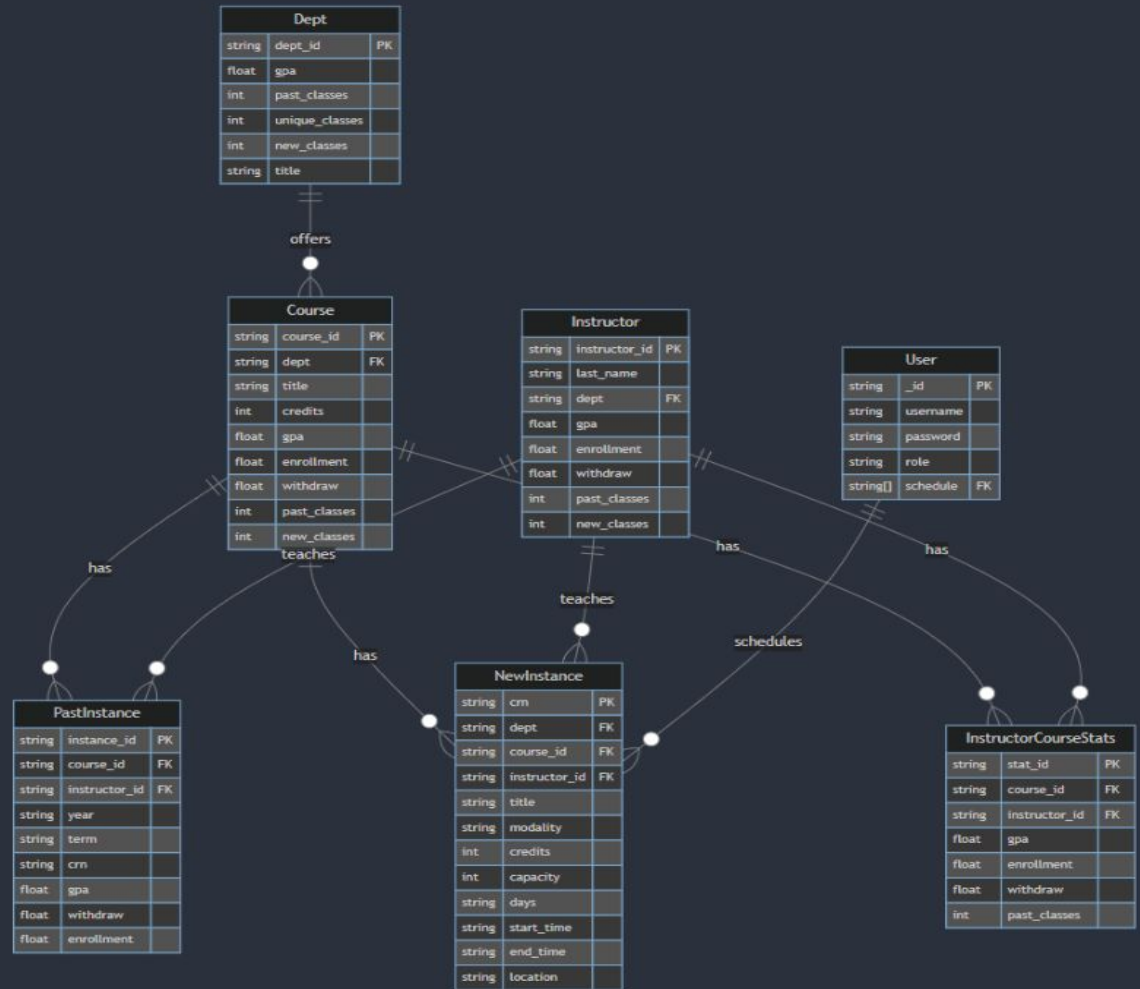
- JavaScript Library for Building User Interfaces
- Enables the creation of dynamic and responsive user interfaces. Simplifies the development of single-page applications.

Node.js:

- JavaScript Runtime Environment
- Allows for the execution of JavaScript code on the server side. Powers the backend of the application with high performance and scalability.



Database Schema:



Pathways Bookstore Information

Important Dates and Registration Information
(opens in a new window)

- Academic Calendar**
- View Exam Schedule**
(Click on the dates table in the Exam column to view exam information. For that particular course section click)
- Exam Times and Lunch CPEs**
- View Transfer Alternatives**
- Course 2-De**

Click on the CRN to view prerequisite enforcement

Select Term, Campus, Subject, and any other applicable search criteria and press "Find Class Sections"

Search Here: You can search by period, course number, for example, selecting MATH subject code and entering a course number of 1 will retrieve all MATH class sections.

Find Class Sections

Term

Course Number

Course Modalities

Course Request Number (CRN)

Pathways General Education

[Search Pathways Contact](#)

Schedule Type

Display

Comments:

FIND class sections

Reset


1	crn,course,title,schedule,mode,modality,cr_hrs,capacity,instructor,days,start_time,end_time,location,exam
2	10058,AAD-1214,Acting Locally,L,Face-to-Face Instruction,2,48,GW Hamming,M,W,2:30PM,3:20PM,WLH 345,14M
3	20556,AAD-1214,Acting Locally,L,Face-to-Face Instruction,2,48,GW Hamming,M,W,1:25PM,2:15PM,WLH 345,13M
4	21223,AAD-4234,Capstone Collaborations,L,Face-to-Face Instruction,3,10,BR Kirkland,W,9:30AM,12:00PM,BURCH 021,09M
5	10059,AAEC-1005,Econ Food Fiber Syst,L,Face-to-Face Instruction,3,70,PW Vertino de Queiroz,M,W,F,1:25PM,2:15PM,SEITZ 300,13M
6	10060,AAEC-1005,Econ Food Fiber Syst,L,Face-to-Face Instruction,3,302,SK Stephenson,M,W,F,12:20PM,1:10PM,SQUIR COLNL,12M
7	10061,AAEC-1006,Econ Food Fiber Syst,L,Face-to-Face Instruction,3,70,N Abedin,M,W,F,10:0AM,11:00AM,SEITZ 300,10M
8	10062,AAEC-1006,Econ Food Fiber Syst,L,Face-to-Face Instruction,3,621,WJ Ellenbrock,M,W,F,9:05AM,9:55AM,SQUIR COLNL,09M
9	10063,AAEC-2104,Personal Financial Planning,L,Face-to-Face Instruction,3,621,WA White,M,W,F,11:15AM,12:05PM,SQUIR COLNL,11M
10	10064,AAEC-2434,Foundations of Agribusiness,L,Face-to-Face Instruction,3,129,P Morelli Mercadante,M,W,F,1:25PM,2:15PM,SMYTH 146,13M
11	10065,AAEC-2974,Independent Study,I,1 TO 19,0,Staff,(ARR),----- (ARR) -----,TBA,00X,
12	10066,AAEC-3004,Agr Prod & Cons Econ,L,Face-to-Face Instruction,3,48,C Wang,T,R,2:00PM,3:15PM,FRLN 002,14T
13	10067,AAEC-3014,Analytic Methods Applied Econ,L,Face-to-Face Instruction,3,72,Z Chen,M,W,4:00PM,5:15PM,WHIT 300,16M
14	10068,AAEC-3024,Monetary Glob Iss Applied Econ,L,Face-to-Face Instruction,3,72,YE Karagulle,M,W,F,1:25PM,2:15PM,NCB 270,13M
15	10069,AAEC-3204,Intl Agri Dvlp & Trad,L,Face-to-Face Instruction,3,48,C Larochele,T,R,11:00AM,12:15PM,NCB 209,11T
16	10070,AAEC-3314,Environmental Law,L,Face-to-Face Instruction,3,143,J Friedel,T,R,11:00AM,12:15PM,NCB 160,11T
17	10071,AAEC-3324,Environment Sustain Dev Econ,L,Face-to-Face Instruction,3,152,MJ Ellenbrock,M,W,F,12:20PM,1:10PM,NCB 260,12M
18	10072,AAEC-3424,Value-Based Mgmt in AgBusiness,L,Face-to-Face Instruction,3,64,PW Vertino de Queiroz,T,R,12:30PM,1:45PM,LITRV 1860,12T
19	21227,AAEC-3424,Value-Based Mgmt in AgBusiness,L,Face-to-Face Instruction,3,0,PW Vertino de Queiroz,M,W,F,10:10AM,11:00AM,FRLN 002,10M
20	10073,AAEC-3454,Small Bus Mgt and Entl,L,Face-to-Face Instruction,3,64,C Wang,T,R,9:30AM,10:45AM,LITRV 1860,09T

Data Cleaning: Standardizing our Schema

scripts > raw_data >  distribution.csv

```
1 "Academic Year","Term","Subject","Course No.,""Course Title","Instructor","GPA","A (%)","A- (%)","B+ (%)","B (%)","B- (%)","C+ (%)","C (%)","C- (%)","D+ (%)","D (%)","F (%)","W (%)","I (%)","S (%)","O (%)","U (%)","X (%)","Y (%)","Z (%)","AA (%)","AB (%)","AC (%)","AD (%)","AE (%)","AF (%)","AG (%)","AH (%)","AI (%)","AJ (%)","AK (%)","AL (%)","AM (%)","AN (%)","AO (%)","AP (%)","AQ (%)","AR (%)","AS (%)","AT (%)","AU (%)","AV (%)","AW (%)","AX (%)","AY (%)","AZ (%)","BA (%)","BB (%)","BC (%)","BD (%)","BE (%)","BF (%)","BG (%)","BH (%)","BI (%)","BJ (%)","BK (%)","BL (%)","BM (%)","BN (%)","BO (%)","BP (%)","BQ (%)","BR (%)","BS (%)","BT (%)","BU (%)","BV (%)","BW (%)","BX (%)","BY (%)","BZ (%)","CA (%)","CB (%)","CC (%)","CD (%)","CE (%)","CF (%)","CG (%)","CH (%)","CI (%)","CJ (%)","CK (%)","CL (%)","CM (%)","CN (%)","CO (%)","CP (%)","CQ (%)","CR (%)","CS (%)","CT (%)","CU (%)","CV (%)","CW (%)","CX (%)","CY (%)","CZ (%)","DA (%)","DB (%)","DC (%)","DD (%)","DE (%)","DF (%)","DG (%)","DH (%)","DI (%)","DJ (%)","DK (%)","DL (%)","DM (%)","DN (%)","DO (%)","DP (%)","DQ (%)","DR (%)","DS (%)","DT (%)","DU (%)","DV (%)","DW (%)","DX (%)","DY (%)","DZ (%)","EA (%)","EB (%)","EC (%)","ED (%)","EE (%)","EF (%)","EG (%)","EH (%)","EI (%)","EJ (%)","EK (%)","EL (%)","EM (%)","EN (%)","EO (%)","EP (%)","EQ (%)","ER (%)","ES (%)","ET (%)","EU (%)","EV (%)","EW (%)","EX (%)","EY (%)","EZ (%)","FA (%)","FB (%)","FC (%)","FD (%)","FE (%)","FF (%)","FG (%)","FH (%)","FI (%)","FJ (%)","FK (%)","FL (%)","FM (%)","FN (%)","FO (%)","FP (%)","FQ (%)","FR (%)","FS (%)","FT (%)","FU (%)","FV (%)","FW (%)","FX (%)","FY (%)","FZ (%)","GA (%)","GB (%)","GC (%)","GD (%)","GE (%)","GF (%)","GG (%)","GH (%)","GI (%)","GJ (%)","GK (%)","GL (%)","GM (%)","GN (%)","GO (%)","GP (%)","GQ (%)","GR (%)","GS (%)","GT (%)","GU (%)","GV (%)","GW (%)","GX (%)","GY (%)","GZ (%)","HA (%)","HB (%)","HC (%)","HD (%)","HE (%)","HF (%)","HG (%)","HH (%)","HI (%)","HJ (%)","HK (%)","HL (%)","HM (%)","HN (%)","HO (%)","HP (%)","HQ (%)","HR (%)","HS (%)","HT (%)","HU (%)","HV (%)","HW (%)","HX (%)","HY (%)","HZ (%)","IA (%)","IB (%)","IC (%)","ID (%)","IE (%)","IF (%)","IG (%)","IH (%)","II (%)","IJ (%)","IK (%)","IL (%)","IM (%)","IN (%)","IO (%)","IP (%)","IQ (%)","IR (%)","IS (%)","IT (%)","IU (%)","IV (%)","IW (%)","IX (%)","IY (%)","IZ (%)","JA (%)","JB (%)","JC (%)","JD (%)","JE (%)","JF (%)","JG (%)","JH (%)","JI (%)","JJ (%)","JK (%)","JL (%)","JM (%)","JN (%)","JO (%)","JP (%)","JQ (%)","JR (%)","JS (%)","JT (%)","JU (%)","JV (%)","JW (%)","JX (%)","JY (%)","JZ (%)","KA (%)","KB (%)","KC (%)","KD (%)","KE (%)","KF (%)","KG (%)","KH (%)","KI (%)","KJ (%)","KK (%)","KL (%)","KM (%)","KN (%)","KO (%)","KP (%)","KQ (%)","KR (%)","KS (%)","KT (%)","KU (%)","KV (%)","KW (%)","KX (%)","KY (%)","KZ (%)","LA (%)","LB (%)","LC (%)","LD (%)","LE (%)","LF (%)","LG (%)","LH (%)","LI (%)","LJ (%)","LK (%)","LL (%)","LM (%)","LN (%)","LO (%)","LP (%)","LQ (%)","LR (%)","LS (%)","LT (%)","LU (%)","LV (%)","LW (%)","LX (%)","LY (%)","LZ (%)","MA (%)","MB (%)","MC (%)","MD (%)","ME (%)","MF (%)","MG (%)","MH (%)","MI (%)","MJ (%)","MK (%)","ML (%)","MM (%)","MN (%)","MO (%)","MP (%)","MQ (%)","MR (%)","MS (%)","MT (%)","MU (%)","MV (%)","MW (%)","MX (%)","MY (%)","MZ (%)","NA (%)","NB (%)","NC (%)","ND (%)","NE (%)","NF (%)","NG (%)","NH (%)","NI (%)","NJ (%)","NK (%)","NL (%)","NM (%)","NO (%)","NP (%)","NQ (%)","NR (%)","NS (%)","NT (%)","NU (%)","NV (%)","NW (%)","NX (%)","NY (%)","NZ (%)","OA (%)","OB (%)","OC (%)","OD (%)","OE (%)","OF (%)","OG (%)","OH (%)","OI (%)","OJ (%)","OK (%)","OL (%)","OM (%)","ON (%)","OO (%)","OP (%)","OQ (%)","OR (%)","OS (%)","OT (%)","OU (%)","OV (%)","OW (%)","OX (%)","OY (%)","OZ (%)","PA (%)","PB (%)","PC (%)","PD (%)","PE (%)","PF (%)","PG (%)","PH (%)","PI (%)","PJ (%)","PK (%)","PL (%)","PM (%)","PN (%)","PO (%)","PP (%)","PQ (%)","PR (%)","PS (%)","PT (%)","PU (%)","PV (%)","PW (%)","PX (%)","PY (%)","PZ (%)","QA (%)","QB (%)","QC (%)","QD (%)","QE (%)","QF (%)","QG (%)","QH (%)","QI (%)","QJ (%)","QK (%)","QL (%)","QM (%)","QN (%)","QO (%)","QP (%)","QQ (%)","QR (%)","QS (%)","QT (%)","QU (%)","QV (%)","QW (%)","QX (%)","QY (%)","QZ (%)","RA (%)","RB (%)","RC (%)","RD (%)","RE (%)","RF (%)","RG (%)","RH (%)","RI (%)","RJ (%)","RK (%)","RL (%)","RM (%)","RN (%)","RO (%)","RP (%)","RQ (%)","RR (%)","RS (%)","RT (%)","RU (%)","RV (%)","RW (%)","RX (%)","RY (%)","RZ (%)","SA (%)","SB (%)","SC (%)","SD (%)","SE (%)","SF (%)","SG (%)","SH (%)","SI (%)","SJ (%)","SK (%)","SL (%)","SM (%)","SN (%)","SO (%)","SP (%)","SQ (%)","SR (%)","SS (%)","ST (%)","SU (%)","SV (%)","SW (%)","SX (%)","SY (%)","SZ (%)","TA (%)","TB (%)","TC (%)","TD (%)","TE (%)","TF (%)","TG (%)","TH (%)","TI (%)","TJ (%)","TK (%)","TL (%)","TM (%)","TN (%)","TO (%)","TP (%)","TQ (%)","TR (%)","TS (%)","TT (%)","TU (%)","TV (%)","TW (%)","TX (%)","TY (%)","TZ (%)","UA (%)","UB (%)","UC (%)","UD (%)","UE (%)","UF (%)","UG (%)","UH (%)","UI (%)","UJ (%)","UK (%)","UL (%)","UM (%)","UN (%)","UO (%)","UP (%)","UQ (%)","UR (%)","US (%)","UT (%)","UU (%)","UV (%)","UW (%)","UX (%)","UY (%)","UZ (%)","VA (%)","VB (%)","VC (%)","VD (%)","VE (%)","VF (%)","VG (%)","VH (%)","VI (%)","VJ (%)","VK (%)","VL (%)","VM (%)","VN (%)","VO (%)","VP (%)","VQ (%)","VR (%)","VS (%)","VT (%)","VU (%)","VV (%)","VW (%)","VX (%)","VY (%)","VZ (%)","WA (%)","WB (%)","WC (%)","WD (%)","WE (%)","WF (%)","WG (%)","WH (%)","WI (%)","WJ (%)","WK (%)","WL (%)","WM (%)","WN (%)","WO (%)","WP (%)","WQ (%)","WR (%)","WS (%)","WT (%)","WU (%)","WV (%)","WW (%)","WX (%)","WY (%)","WZ (%)","XA (%)","XB (%)","XC (%)","XD (%)","XE (%)","XF (%)","XG (%)","XH (%)","XI (%)","XJ (%)","XK (%)","XL (%)","XM (%)","XN (%)","XO (%)","XP (%)","XQ (%)","XR (%)","XS (%)","XT (%)","XU (%)","XV (%)","XW (%)","XX (%)","XY (%)","XZ (%)","YA (%)","YB (%)","YC (%)","YD (%)","YE (%)","YF (%)","YG (%)","YH (%)","YI (%)","YJ (%)","YK (%)","YL (%)","YM (%)","YN (%)","YO (%)","YP (%)","YQ (%)","YR (%)","YS (%)","YT (%)","YU (%)","YV (%)","YW (%)","YX (%)","YY (%)","YZ (%)","ZA (%)","ZB (%)","ZC (%)","ZD (%)","ZE (%)","ZF (%)","ZG (%)","ZH (%)","ZI (%)","ZJ (%)","ZK (%)","ZL (%)","ZM (%)","ZN (%)","ZO (%)","ZP (%)","ZQ (%)","ZR (%)","ZS (%)","ZT (%)","ZU (%)","ZV (%)","ZW (%)","ZX (%)","ZY (%)","ZZ (%)"
```



scripts > cleaned_data >  past_instance.csv

```
1 instance_id,course_id,instructor_id,year,term,crn,gpa,withdraw,enrollment
2 2018-19Fall80350,AOE 4254,Alexander (AOE),2018-19,Fall,80350,3.34,0,5
3 2018-19Fall81619,BMVS 6094,Rossmesl (BMVS),2018-19,Fall,81619,3.74,0,5
4 2018-19Fall83585,EDCI 5844,Wells (EDCI),2018-19,Fall,83585,4.0,0,5
5 2018-19Fall83586,EDCI 5844,Wells (EDCI),2018-19,Fall,83586,4.0,0,5
6 2018-19Fall84308,ESM 3064,Aidi (ESM),2018-19,Fall,84308,3.6,0,5
7 2018-19Fall84615,FREC 3454,Wiseman (FREC),2018-19,Fall,84615,3.2,0,5
8 2018-19Fall86732,MUS 2244,Lantz Crone (MUS),2018-19,Fall,86732,4.0,1,5
9 2018-19Fall86740,MUS 2514,Cowan (MUS),2018-19,Fall,86740,3.8,0,5
10 2018-19Fall86755,MUS 2634,Easter (MUS),2018-19,Fall,86755,3.0,0,5
```

User Authentication

Registration

- Endpoint: /api/user/register
- Method: POST
- Payload: { username: String, password: String }
- Description: New users can register by providing a unique username and a password. The password is hashed before being stored in the database for security.

Create Admin (Admin only)

- Endpoint: /api/user/createAdmin
- Method: POST
- Headers: { Authorization: Bearer Token }
- Payload: { username: String, password: String }
- Description: This endpoint is restricted to admin users. It allows an admin to create a new admin account by providing a username and password.

Login

- Endpoint: /api/user/login
- Method: POST
- Payload: { username: String, password: String }
- Description: Registered users can log in using their username and password. Upon successful login, a JSON Web Token (JWT) is generated and returned to the user. This token is used for subsequent requests to authenticate the user.

Change Password

- Endpoint: /api/user/changePassword
- Method: POST
- Headers: { Authorization: Bearer Token }
- Payload: { oldPassword: String, newPassword: String }
- Description: Allows authenticated users to change their password. Users must provide their old password for verification and a new password.

Overview of JWT and bcrypt

JWT (JSON Web Tokens): JWTs are used to securely transmit information between parties as a JSON object. In this project, JWTs are used to manage user sessions after authentication. When a user logs in, they receive a token that is used to authenticate subsequent HTTP requests to the server. This token ensures that the requests are made by an authenticated user.

bcrypt: bcrypt is a password-hashing function. In this project, bcrypt is used to hash user passwords before they are stored in the database. When a user logs in, bcrypt is used again to compare the hashed version of the entered password with the hash stored in the database. This approach enhances security by ensuring that actual passwords are not stored in the database.

Bcrypt Password Hashing

“Password123”



“\$2a\$12\$9Nto7MDPJ a4eurzsxgmNb.3M
glJDfuKdK612nvkUvGCJMDUKZ.xHq”

models > JS Userjs > [x] <unknown>

```
1  const mongoose = require('mongoose');
2  const bcrypt = require('bcryptjs');
3
4  const userSchema = new mongoose.Schema({
5    username: { type: String, required: true, unique: true },
6    password: { type: String, required: true },
7    role: { type: String, default: 'user' }, // 'admin' for admin users
8    schedule: [{ type: String }]
9  });
10
11 // Hash password before saving
12 userSchema.pre('save', async function(next) {
13   if (!this.isModified('password')) return next();
14   this.password = await bcrypt.hash(this.password, 12);
15   next();
16 });
17
18 module.exports = mongoose.model('User', userSchema, 'user');
```

CourseCrafterDB.user

Documents

Aggregations

Schema

Indexes

Validation

Filter



Type a query: { field: 'value' } or [Generate query](#)

+ ADD DATA

EXPORT DATA

```
_id: ObjectId('656d2c08c25a62cc8b42f8d5')
username: "Admin"
password: "$2a$12$9Nto7MDPJ a4eurzsxgmNb.3MglJDfuKdK612nvkUvGCJMDUKZ.xHq"
role: "admin"
schedule: Array (empty)
```

JWT: Middleware Authorization

```
/**
 * Middleware to protect routes by verifying the JWT token.
 * This ensures that the route is accessed by an authenticated user.
 */
const protect = async (req, res, next) => {
  let token;

  // Check if the authorization header is present and starts with 'Bearer'
  if (req.headers.authorization && req.headers.authorization.startsWith('Bearer')) {
    try {
      // Extract the token from the authorization header
      token = req.headers.authorization.split(' ')[1];

      // Verify the token using jwt.verify and the secret from environment variables
      const decoded = jwt.verify(token, process.env.JWT_SECRET);

      // Find the user based on the ID in the decoded token and attach the user object to the request
      // Exclude the password when attaching the user object
      req.user = await User.findById(decoded.id)

      // Proceed to the next middleware
      next();
    } catch (error) {
      // If token verification fails, send a 401 Unauthorized response
      res.status(401).json({ message: 'Not authorized', error });
    }
  } else {
    // If no token is provided in the headers, send a 401 Unauthorized response
    res.status(401).json({ message: 'Not authorized', error });
  }
};

/**
 * Middleware to check if the authenticated user is an admin.
 * This is used to protect routes that should only be accessible by admin users.
 */
const admin = (req, res, next) => {
  // Check if the user exists and has the role 'admin'
  if (req.user && req.user.role === 'admin') {
    // Proceed to the next middleware
    next();
  } else {
    // If the user is not an admin, send a 401 Unauthorized response
    res.status(401).json({ message: 'Not authorized as an admin' });
  }
};
```

Site Functionality

Department List (Home)

CourseCrafters

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Welcome to CourseCrafters! This web app provides detailed information about courses, departments, and instructors from the past 5 years at Virginia Tech.

Departments

ID ↓	Title ↓	GPA ↓	Past Classes ↓	Unique Classes ↓	New Classes ↓
AAD	Architecture, Arts, and Design	3.85	3	3	3
AAEC	Agricultural and Applied Economics	3.39	280	60	43
ACIS	Accounting and Information Systems	3.17	939	48	88
ADV	Advertising	3.27	4	2	6
AFST	Africana Studies	3.54	119	18	20
AHRM	Apparel, Housing, and Resource Management	3.64	45	4	4
AINS	American Indian Studies	3.76	61	8	6
ALCE	Agricultural, Leadership, and Community Education	3.77	173	44	24
ALS	Agriculture and Life Sciences	3.40	206	41	21
AOE	Aerospace and Ocean Engineering	3.47	734	109	97
APS	Appalachian Studies	3.70	64	11	6
APSC	Animal and Poultry Sciences	3.47	376	51	59
ARBC	Arabic	3.58	102	15	12
ARSH	Architectural Science and History	3.66	4445	73	471

Department Detail - Courses Tab

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CS - Computer Science

[Courses](#)[Instructors](#)

ID ↓	Title ↓	Credits ↓	GPA ↓	Enrollment ↓	Withdraw ↓	Withdraw Rate ↓	Past Classes ↓	New Classes ↓
CS 1014	Intro Computational Thinking	3	3.20	51.06	2.00	3.92%	18	1
CS 1044	Intro Prog in C	3	3.19	69.10	2.30	3.33%	10	1
CS 1054	Intro to Programming in Java	3	2.87	103.20	8.00	7.75%	10	1
CS 1064	Intro to Programming in Python	3	3.58	278.38	4.14	1.49%	21	4
CS 1114	Intro to Software Design	3	2.59	140.04	27.31	19.50%	26	3
CS 2064	Intermediate Prog in Python	3	3.19	67.50	2.25	3.33%	4	1
CS 2104	Intro to Problem Solving in CS	3	3.48	62.44	0.78	1.25%	36	4
CS 2114	Softw Des & Data Structures	3	3.14	150.83	6.69	4.44%	29	2
CS 2144	Competitive Problem Solving I	3	3.81	10.50	0.50	4.76%	2	0
CS 2164	Foundations Security Environ	3	3.66	20.07	0.57	2.84%	14	2
CS 2304	Special Study	1	3.59	21.79	2.07	9.50%	28	1
CS 2505	Intro Computer Organization	3	2.93	115.04	10.23	8.89%	26	3

Department Detail - Instructors Tab

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CS - Computer Science

Courses **Instructors**

Search by Last Name...

Last Name ↓	GPA ↓	Enrollment ↓	Withdraw ↓	Withdraw Rate ↓	Past Classes ↓	New Classes ↓
Abdelrahman	3.00	86.50	7.00	8.09%	2	0
Adhikari	3.75	10.00	0.00	0.00%	1	0
Ahmadian	3.57	72.00	3.00	4.17%	1	0
Alsafwan	3.92	85.33	0.33	0.39%	3	0
Back	3.57	44.18	2.05	4.64%	22	2
Balci	3.16	28.04	2.82	10.06%	28	4
Barnette	2.60	166.54	24.00	14.41%	13	0
Beattie	3.86	5.00	0.00	0.00%	1	1
Bhattacharya	3.32	16.00	1.50	9.38%	2	1
Bowman	3.68	18.40	0.00	0.00%	5	1
Brantly	3.69	20.33	0.33	1.62%	6	2
Brown	3.91	50.50	0.00	0.00%	2	1

Course Detail - New Instances Tab

CourseCrafters

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Welcome to CourseCrafters! This web app provides detailed information about courses, departments, and instructors from the past 5 years at Virginia Tech.

CS 1114 - Intro to Software Design

[New Instances](#) [Instructor Course Stats](#) [Past Instances](#)

Search by CRN / Instructor...

CRN ↓	Title ↓	Instructor ID ↓	Modality ↓	Credits ↓	Capacity ↓	Days ↓	Start Time ↓	End Time ↓	Location ↓
13273	Intro to Software Design	McPherson (CS)	F2F	3	270	M W	9:05AM	9:55AM	TORG 2150
13275	Intro to Software Design	Emebo (CS)	F2F	3	150	T R	2:00PM	2:50PM	SURGE 104C
20931	Intro to Software Design	McPherson (CS)	F2F	3	150	M W	4:00PM	5:15PM	TORG 3100

Course Detail - Instructor Course Stats Tab

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CS 1114 - Intro to Software Design

[New Instances](#) [Instructor Course Stats](#) [Past Instances](#)

Search by Instructor...

Instructor ID ↑	GPA ↑	Enrollment ↑	Withdraw ↑	Withdraw Rate ↑	Past Classes ↑
Barnette (CS)	2.51	184.67	30.00	16.25%	9
Cao (CS)	2.56	29.00	14.00	48.28%	1
Edwards (CS)	2.39	225.33	77.00	34.17%	3
Feng (CS)	2.81	104.00	14.00	13.46%	1
Hillman (CS)	2.72	100.00	15.50	15.50%	2
Irwin (CS)	2.72	116.00	20.50	17.67%	2
Kotut (CS)	2.98	83.00	4.67	5.63%	3
McPherson (CS)	2.47	240.00	30.00	12.50%	1
Senger (CS)	2.50	62.25	16.25	26.10%	4

Course Detail - Past Instances Tab

Welcome to CourseCrafters! This web app provides detailed information about courses, departments, and instructors from the past 5 years at Virginia Tech.

CS 1114 - Intro to Software Design

[New Instances](#) [Instructor Course Stats](#) [Past Instances](#)

Search by Instructor...

Instructor ID ↑	Year ↑	Term ↑	CRN ↑	GPA ↑	Enrollment ↑	Withdraw ↑	Withdraw Rate ↑
Senger (CS)	2022-23	Fall	90770	1.92	22	10	45.45%
Barnette (CS)	2021-22	Spring	22770	2.29	26	7	26.92%
Cao (CS)	2022-23	Fall	92007	2.56	29	14	48.28%
Senger (CS)	2022-23	Spring	13292	2.56	29	5	17.24%
Kotut (CS)	2019-20	Spring	12932	3.08	69	0	0.00%
Kotut (CS)	2019-20	Spring	12933	2.99	69	1	1.45%
Barnette (CS)	2021-22	Fall	83038	1.94	69	39	56.52%
Hillman (CS)	2022-23	Fall	90769	2.89	72	20	27.78%
Barnette (CS)	2019-20	Spring	19676	2.97	85	0	0.00%
Senger (CS)	2022-23	Fall	90768	2.73	89	25	28.09%
F...	2022-23	Fall	13870	2.81	101	11	10.9%

Sign Up and Sign In

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Sign Up

<input type="text" value="Username"/>	<input type="password" value="Password"/>	<input type="button" value="Sign Up"/>
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Sign In

<input type="text" value="Username"/>	<input type="password" value="Password"/>	<input type="button" value="Sign In"/>
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Admin Page

CourseCrafters

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User Page

Username: Eric

Role: admin

Change Password

<input type="password"/>	<input type="password"/>	<input type="password"/>	<input type="button" value="Change Password"/>
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Create New Admin

<input type="text"/>	<input type="password"/>	<input type="button" value="Create Admin"/>
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User Page

CourseCrafters

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User Page

Username: Mark

Role: user

Change Password

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Course Detail - New Instances Tab - Signed In

Welcome to CourseCrafters! This web app provides detailed information about courses, departments, and instructors from the past 5 years at Virginia Tech.

CS 1114 - Intro to Software Design

[New Instances](#) [Instructor Course Stats](#) [Past Instances](#)

Search by CRN / Instructor...




Action	CRN ↓	Title ↓	Instructor ID ↓	Modality ↓	Credits ↓	Capacity ↓	Days ↓	Start Time ↓	End Time ↓	Location ↓
+	13273	Intro to Software Design	McPherson (CS)	F2F	3	270	M W	9:05AM	9:55AM	TORG 2150
+	13275	Intro to Software Design	Emebo (CS)	F2F	3	150	T R	2:00PM	2:50PM	SURGE 104C
+	20931	Intro to Software Design	McPherson (CS)	F2F	3	150	M W	4:00PM	5:15PM	TORG 3100

Schedule Page - Signed In

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Eric's Schedule

CRN / Instructor / Course...

Action	CRN ↓	Title ↓	Course ID ↓	Instructor ID ↓	Modality ↓	Credits ↓	Capacity ↓	Days ↓	Start Time ↓	End Time ↓	Location ↓
	13273	Intro to Software Design	CS 1114	McPherson (CS)	F2F	3	270	M W	9:05AM	9:55AM	TORG 2150
	14558	Principles of Economics	ECON 2005	Owusu-Brown (ECON)	F2F	3	50	M W F	12:20PM	1:10PM	DER 3081
	18299	Music Appreciation	MUS 1104	Lantz Crone (MUS)	OnlineAsync	3	150	(ARR)	(ARR)	(ARR)	00X

Work Distribution (This is very generalized)

Eric -

- Scripting
 - Data Scraping
 - Data Cleaning
 - Data Importing
- Database Creation
 - Collection Creation
 - Relational Schema
- Backend
 - Express
 - Rest Apis

Mark -

- User Authentication
 - Password Hashing
 - Token Authentication
- Frontend
 - React framework
 - User interface
 - User experience
 - Site functionality

Biggest Challenges

1. Instructor Standardization: Offered course instructor data was structure differently than the distribution database. A lot of annoying edge cases with hyphens and two+ names.
2. Data Scraping: This script went through more iterations than I would like to disclose, almost made us switch topics...
3. Token authentication...

What did we learn?

1. Creating a full stack project using the extremely popular MERN stack (Mongo, Express, React, Node).
2. Debugging using the console. (Both backend and frontend consoles)
3. Updating database schemas to better fit new aspects of the overall project.
4. How to code for other eyes.

Real Customers: Our Roommates

Questions?