

queer

y search engine

chaira harder

- (1) input documents**
- (2) define vocabulary words we care about**
- (3) type a search query**
- (4) output gives us best matching document (closest cos similarity value to 1)**



CHEMISTRY

Concordia International School Hanoi
School Year 2020-21 v.1

Course Outline:

Chemistry is a two-semester laboratory course to develop an understanding of the structure of matter and its interactions. All major areas of inorganic chemistry are covered. The course is designed to supply an adequate background for students who intend to enroll in AP Chemistry and/or college chemistry courses. Chemistry makes frequent use of math skills to solve chemical problems. Some memorization of chemical symbolism is required. The course will provide an opportunity for students to develop scientific process skills, critical thinking skills, some laboratory techniques.

Teaching and Learning Philosophy:

Having the right answer is not always the most important goal in Science. But having the right questions is important. Science with only answers and no questions is useless. Learning and science advancement can only take place if you have a head full of questions that test, try, and challenge what is obvious to some and the conventional thought of the day. It is best not to blindly accept everything that scientists, teachers, professors, the media, and textbooks tell you.

Prerequisites:

Biology, Algebra 1

Timing and Topic Order:

Semester 1	Semester 2
<ul style="list-style-type: none">Matter and Change.<ul style="list-style-type: none">5 daysScientific Measurement.<ul style="list-style-type: none">4 daysAtomic Structure.<ul style="list-style-type: none">4 daysElectron Configuration in Atoms.<ul style="list-style-type: none">6 daysPeriodic Law and the Table.<ul style="list-style-type: none">5 daysChemical Bonding.<ul style="list-style-type: none">7 daysChemical Names and Formulas.<ul style="list-style-type: none">6 daysChemical Equations and Reactions.<ul style="list-style-type: none">5 days	<ul style="list-style-type: none">Stoichiometry.<ul style="list-style-type: none">6 daysStates of Matter.<ul style="list-style-type: none">5 daysThe Behavior of Gases.<ul style="list-style-type: none">5 daysSolutions<ul style="list-style-type: none">5 daysAcids and Bases<ul style="list-style-type: none">5 daysAcid-Base Titration and pH<ul style="list-style-type: none">3 daysReaction Energy<ul style="list-style-type: none">3 daysElective Chemistry Unit<ul style="list-style-type: none">3 days

Hard Copy Textbook:

Sarquis, Sarquis, 2012, *Modern Chemistry*, Houghton Mifflin Harcourt, Orlando Florida

Electronic Textbook:

my.hrw.com username & password are distributed to students in class and via email. It is necessary to allow popup screens for this site in your computer's settings

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Smith College

Accounting

Financial Accounting 223

Spring 2025

Time: Monday/Wednesday from 3:05 p.m. to 4:20 p.m.

Location: Stoddard G2

Office Hours Triani: M, 4:30-5:30 p.m., W, 4:30-5:30 p.m.

Office Hours TA: Thursday 7:00-8:00 p.m.

Course Description

Accounting 223 is a great introduction to the world of business. In fact, accounting is called the "language of business." That's because the very purpose of accounting is to provide meaningful financial information to individuals and institutions that have an interest in business, whether they be investors, creditors, or managers. The goal of this course is to give you a firm grasp of essential accounting and business terminology and techniques that you will need to succeed in a business environment. Regardless of what your major is, financial accounting is one of the most important courses you will take because it is fundamental to your success in the business world beyond college. Even if you do not think of yourself as a "businessperson," you will, during your life, engage in business activities. Being able to understand and interpret financial accounting information is central to making informed financial decisions in life. How information is gathered, measured, summarized, and reported can have profound effects on how it is (and/or should be) interpreted and used in making judgments and decisions. This class will be an important one for anyone who is interested in someday participating in or investing in a business.

At the end of the class, you will be able to:

- Explain why accounting is important, identify the components of the accounting equation, prepare the financial statements (Income statement, Balance sheet, Statement of changes in stockholder's equity and Statement of cash flow).
- Perform the accrual accounting, deferrals and explain the effect on the financial statements.
- Apply the double-entry accounting system, use the T account, prepare the trial balance and the closing entries.
- Perform the accounting for merchandising business (record the following transactions: purchase, purchase returns, discount, transportation costs and the effect on the inventory).
- Execute the accounting for inventories (LIFO, FIFO, weighted average cost methods).
- Apply the accounting for: receivables, long-term operational assets, current liabilities and long-term debt.

Syllabus GER 110Y Elementary German, Spring 2025

GER 110Y-01 M W F 9:25 – 10:40
GER 110Y-02 M W F 10:50 – 12:05
Class location: Hatfield 204

Professor: Sandra Digruber, Ph.D.
E-Mail: sdigruber@smith.edu
Office hours: Mon 1:00-2:30 PM EST/EDT or by appointment
Tyler Annex 105
Location: Tyler Annex 105
Please sign up via [Calendly](#)

Willkommen zu Ihrem zweiten Semester von GERMAN 110!

Course Description

Enjoy the adventure of expanding on your German language skills.

In the second semester of **German 110**, you will build on your skills for communicating (speaking, reading, writing, and listening) in German. You will learn how to complete a number of tasks in German (including expressing opinions, drawing comparisons, conducting interviews, reporting on past events, making a formal complaint). Furthermore, you will get to know cultural aspects of German-speaking countries and be introduced to additional grammatical structures.

Required Texts

Netzwerk NEU A2:

- Textbook** (*Kursbuch*) – physical copy
- Workbook** (*Übungsbuch*) – interactive online workbook

Go to [the landing page the publisher has created for us](#) to buy a discounted bundle.

Just like in the previous semester, the 12 chapters are organized around cultural themes that beginning speakers of German will encounter when they travel to German-speaking countries or interact with native speakers. All along the way, we will reflect on grammar points that are necessary for speaking German idiomatically in context.

In addition to your homework (**estimate around 6-8 hours per week**), you are required to meet with our TAs for oral exercises and conversation once a week.

```
66 %% LOAD PDFs
67 [fileNames, filePath] = uigetfile('*.pdf','Select PDF files','MultiSelect','on');
68
69 % case where 1 file is selected:
70 if ischar(fileNames)
71     fileNames = {fileNames};
72 end
73
74 n = length(fileNames); % num documents
75
76 documents = strings(n,1);
77
78 %% READ PDFs
79
80 % loop through and extract words/content
81 for i = 1:n
82     documents(i) = extractFileText(fullfile(filePath, fileNames{i}));
83 end
84
85 % confirm
86 disp('!All documents loaded successfully!');
```

```
89 %% GET SEARCH VOCAB
90
91 % initially hardcoded:
92 % vocab = ["vector", "matrix", "real", "complex"];
93 % m = length(vocab); % num words of interest
94
95 % using user input:
96 prompt = 'ENTER VOCAB WORDS -- SEPARATE BY SPACES: ';
97 user_input = input(prompt, 's');
98
99 vocab = split(user_input);
100
101 m = length(vocab); % num words of interest
```

```
103 %% FREQUENCY MATRIX A
104
105 A = zeros(m, n);
106
107 for j = 1:n % per doc
108     textDoc = lower(documents(j)); % convert all content to lowercase
109     for i = 1:m % for each search word we want
110         word = vocab(i);
111         A(i,j) = count(textDoc, word); % individual word count
112     end
113 end
114
115 disp('Frequency matrix A:');
116 disp(A);
```

	doc. 1	doc. 2
vector	4	1
matrix	0	7
real	3	2
complex	1	4

and define $A = \begin{bmatrix} 4 & 1 \\ 0 & 7 \\ 3 & 2 \\ 1 & 4 \end{bmatrix}$

[attendance account]

```
119 %% DEFINE QUERY AKA SEARCH
120
121 % query_input = input('Enter word(s) to search for -- separate by space: ');
122 query_input = input('Enter word(s) to search for -- SEPARATE BY SPACES: ', 's');
123
124 % I can try to make this easier for the user maybe but I think it would take too long to run
125 query_words = split(query_input);
126
127 q = zeros(m,1);
128
129 % 1 if the word is matched with query
130 for i = 1:m
131     if any(strcmpi(vocab(i), query_words))
132         q(i) = 1;
133     end
134 end
135
136 disp('Query vector q:');
137 disp(q);
```


[attendance account]

$$\begin{aligned} q &= \begin{bmatrix} 1 & 0 & 0 & 0 \end{bmatrix}^T \text{ gives } \cos(\theta_1) = 4/\sqrt{26} \text{ and } \cos(\theta_2) = 1/\sqrt{70}, \\ q &= \begin{bmatrix} 0 & 1 & 0 & 0 \end{bmatrix}^T \text{ gives } \cos(\theta_1) = 0/\sqrt{26} \text{ and } \cos(\theta_2) = 7/\sqrt{70}, \\ q &= \begin{bmatrix} 0 & 0 & 1 & 0 \end{bmatrix}^T \text{ gives } \cos(\theta_1) = 3/\sqrt{26} \text{ and } \cos(\theta_2) = 2/\sqrt{70} \text{ and} \\ q &= \begin{bmatrix} 1 & 0 & 0 & 1 \end{bmatrix}^T \text{ gives } \cos(\theta_1) = 5/(\sqrt{2}\sqrt{26}) \text{ and } \cos(\theta_2) = 5/(\sqrt{2}\sqrt{70}). \end{aligned}$$

```
140 %% MEASURE SIMILARITY USING COSINE SIMILARITY
141
142 [U, S, V] = svd(A); % SVD computation
143
144 k = min(2, rank(A)); % keep 2, or rank(A). whichever is smaller
145 Uk = U(:,1:k);
146 Sk = S(1:k,1:k);
147 Vk = V(:,1:k);
```

$$A \approx A^{(k)} = U^{(k)} \Sigma_k (V^{(k)})^T \text{ with } k < \text{rank}(A) = r.$$

Uk maps words

Vk maps documents

Sk holds singular values (shows “importance” of each pattern)

```

150 %% PROJECTED QUERY VS DIRECT QUERY (EXAMPLE 2 vs 1 in textbook -- more precise search)
151
152 c = Uk' * q; % project query onto compressed space
153
154 cos_theta = zeros(n,1);
155
156 for j = 1:n
157     Sj = Sk * Vk(j,:)' ; % Sk * V_k' col
158     numerator = dot(c, Sj);
159     denominator = norm(c) * norm(Sj);
160     cos_theta(j) = numerator / denominator;
161 end

```

- (1) Search directly on compressed A_k
- (2) First project query onto the compressed space, then search

First search engine approximation is

$$\cos(\theta 1_j) \equiv \frac{q^T U^{(k)} S_j}{\|q\|_2 \|S_j\|_2}.$$

Second search engine approximation is

$$\cos(\theta 2_j) \equiv \frac{q^T U^{(k)} S_j}{\|(U^{(k)})^T q\|_2 \|S_j\|_2} \geq \cos(\theta 1_j).$$

- (1) **Search directly on compressed A_k**
- (2) **First project query onto the compressed space, then search**

```
163 %% OUTPUT
164
165 disp('Cosine similarity scores:\n');
166 for j = 1:n
167     fprintf('%s: %.4f\n', fileNames{j}, cos_theta(j));
168 end
169
170 [~, best_doc] = max(cos_theta);
171
172 fprintf('\nBest matching document is: %s\n', fileNames{best_doc});
```

$$\cos(\theta_{1j}) \equiv \frac{q^T U^{(k)} S_j}{\|q\|_2 \|S_j\|_2}.$$

Command Window

```
>> finalprojectmth
Cosine similarity scores:\n
Doc 1: 0.4087
Doc 2: 0.9962
```

```
Best matching document is: 2.
END THEORY:
```

```
-----
MY CODE: All documents loaded successfully!
```

```
ENTER VOCAB WORDS -- SEPARATE BY SPACES: attendance exam german quiz chem account silvia financial office
```

```
Frequency matrix A:
```

2	5	5
0	19	7
0	0	16
2	15	5
14	0	0
0	36	0
0	1	0
0	9	0
0	7	2

```
Enter word(s) to search for -- SEPARATE BY SPACES: attendance account
```

```
Query vector q:
```

1
0
0
0
0
1
0
0
0

```
Cosine similarity scores:\n
Chemistry Syllabus, Kilback, 2020-2021.pdf: 0.4041
Financial Accounting syllabus.pdf: 0.9999
GER 110Y Syllabus_S25 [01-23-25].docx - Google Docs.pdf: 0.2995
```

```
Best matching document is: Financial Accounting syllabus.pdf
```

```
fx >> |
```

Limitations

- **Speed / runtime**

Expanding

- **Contextual searching (NLP ML)**

```
180 % -----
181 %% RESOURCES
182 % -----
183
184 % To import multiple PDF files from local computer:
185 % https://www.mathworks.com/help/matlab/ref/uigetfile.html
186
187 % Singular value decomposition in MATLAB
188 % https://www.mathworks.com/help/matlab/ref/double.svd.html
189 % https://www.mathworks.com/help/symbolic/singular-value-decomposition.html
190
191 % User input in MATLAB:
192 % https://www.mathworks.com/help/matlab/ref/input.html
193
194 % Array methods in MATLAB:
195 % https://www.mathworks.com/help/matlab/matrices-and-arrays.html
```

Thank you!