Research Skills for Engineering Students

Module 5: Academic databases
Welcome to Research Skills for Engineering Students module 5, part 1, academic databases. In this section, you'll learn what databases are, and some tips for searching them effectively.

What's an academic database?
As mentioned, Google and Summon are great ways to get started on your research. But it can be difficult to sift through all the results, especially if you want scholarly resources from a specific subject area.

To find the best resources on your topic, you should search in academic databases, in addition to Google and Summon.

Databases provide access to journal articles and conference proceedings, as well as other scholarly resources. You get more relevant and focused results, because they have better quality control and search functionality.

You should choose a database based on subject area, date coverage, and publication type. Interfaces vary between databases, but the search techniques remain essentially the same.

Database operators & tools
There are search operators you can use throughout most databases, which help to include and exclude results.

- The word OR
  - Broadens your search by capturing synonyms or variant spellings of a concept. It means you're looking for results that have either of the terms.
  - Example: wireless communication OR mobile communication will find results that have either term present
- The word AND
  - Narrows a search by capturing two or more ideas or concepts. It means you're looking for results that have both or all of the concepts.
  - Example: bridge AND earthquake will find results that have both terms present

Brackets/Parentheses ( ) gather OR’d synonyms of a concept together, while combining them with another concept
- Example: (earthquake OR seismic) AND liquefaction

Quotation marks “ ” narrow your search by finding words together as a phrase, instead of separately
- Example: “British Columbia” will make sure you find the province of British Columbia, and won't find other results where the words appear separately

In many databases, an asterisk (*) will act as a truncation symbol, which expands your search results to find various endings of a word stem.
- Example: structur* will find structure, structures, structural, structured…

A good way to brainstorm relevant keywords is through controlled vocabulary or subject headings. They describe what the article is about, and can be found in the detailed view of an article record. The vocabulary or headings make up a list in the database known as a thesaurus. The thesaurus contains synonyms, as well as broader and narrower terms. You'll see an example of using a thesaurus in part 2 of this module.

You can find more tips from UBC Library at Databases – Search Strategies.

That concludes module 5, part 1. In the next video, you'll learn how to find scholarly engineering resources in the engineering database Compendex.
Welcome to Research Skills for Engineering Students module 5, part 2, academic databases. In this video, you’ll learn why the engineering database *Compendex* is a good database to use when looking for scholarly engineering research.

**Compendex**

*Compendex* is a database for scholarly engineering resources. It contains millions of articles from engineering journals and conference proceedings, some of which may not be found in *Summon*.

To access *Compendex*, click the *Indexes & Databases* tab from the UBC Library homepage, and search for “Compendex.” Click the database name to access it.

When searching *Compendex*, it’s best to enter your concepts into separate search boxes. You can use search operators described in part 1 of this module within each search box, as well as through the drop-down selections on the left-hand side.

For example, let’s review one of our research questions from module 1, “What types of buildings or infrastructure are most susceptible to earthquake damage?” We might start by searching for:

- `building* OR infrastructure`
- `AND earthquake* OR seismic`
- `AND susceptib* OR risk*`

You’ll see that the number of results retrieved by *Compendex* are much less than those from Google or *Summon*. The results are primarily scholarly journal articles and conference proceedings, focused on engineering topics.

Once you have a results list, you can sort them by relevance, date, author, or source. There are a number of filters or limits on the left-side of the search results screen - explore these to determine some of the most helpful options for you!

To learn more about an article, click the *Detailed* link. Here, you can see more information about the authors, source, and read the abstract.

You’ll also see a number of terms in the article record - these are controlled vocabulary or subject headings introduced in module 5, part 1. They describe what the article is about. The terms make up the database’s thesaurus, which contains synonyms, as well as broader and narrower terms. You can search the thesaurus by using the *Thesaurus Search* tab from the *Compendex* search page. For example, if we search for *Skyscrapers*, we’ll see that we are directed to use the term *Tall buildings*. A broader term for *Tall buildings* is *Buildings*. The thesaurus helps capture the various terms that can be used to describe a single concept. Not every term is found in the thesaurus; do a keyword search if you can’t find your term. *Ask a librarian* for help with the thesaurus if needed!

To access the full text of a journal article or conference proceeding, click the *UBC elink* button. You’ll usually be brought to this page from UBC Library, which will tell you where you can access the article. Click *Full Text Online*. Depending on who publishes the journal article, the webpage you arrive at may look a little different. What you want to look for is how you can download or save the PDF. Sometimes the article is only available in HTML format.

Sometimes after you click the UBC elink, you may see that the item is not available online. There are a lot of resources that UBC Library doesn’t have access to, but you may find useful for your report! Check if there are any print copies in the library by clicking on *Search UBC Library Catalogue*. If the article isn’t available online or in print, you can request it be brought in for you via *UBC InterLibrary Loan*. 
This is a free service for UBC students, faculty, and staff. However, it takes time to bring in the item - research early, so you have time to acquire all the resources you need! See UBC Library’s InterLibrary Loan pages for more information. If you’re having any difficulty in finding or accessing an article, ask a librarian!

That concludes module 5, part 2. Compendex is but one database you can use in your engineering research. Every database holds different content, so will provide different results. In the next video, you’ll learn about Web of Science, a useful multidisciplinary database.

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Welcome to Research Skills for Engineering Students module 5, part 3, academic databases. In this video, you’ll learn about the Web of Science database.

**Web of Science**

In module 5 part 2, we introduced the engineering database Compendex. But it’s not the only database you should use!

**Web of Science** is a multidisciplinary database. It can be especially helpful when searching for interdisciplinary aspects of your engineering problem. Like Compendex, you can find Web of Science through the Indexes and Databases tab on the UBC Library homepage.

Each database contains unique content. When we do the same search from module 5, part 2, you’ll notice we get different results than we found in Compendex. You may need to search multiple databases as part of your research process.

Like Compendex, Web of Science has many features that are helpful when searching and narrowing your results. There are a number of filters or limits on the left-side of the search results screen, and a number of ways to sort your results.

Web of Science provides the ability to sort by Times Cited, which indicates the number of times an article has been used and cited by other articles in the database. However, it takes time for an article to be cited after publication, so a lower Times Cited count does not necessarily mean that the article won’t be influential or highly cited in the future. Times Cited is one criteria you can use when evaluating search results, amongst others. You will want to decide whether or not an article is appropriate for your needs using some of the strategies discussed in module 2.

Click the article’s title to see more information about it. On the right-side, you’ll see links for both Times Cited and Cited References. Use these to find articles that cited this article (so were published after this one), as well as those cited within this article (so were published before this one). This allows you to follow citations through time, finding other articles published before and after an article. This is one way to find additional relevant articles, and should be part of your research process. Ask a librarian for help if needed!

That concludes module 5, part 3. There are many other helpful resources you can use during your research. In the next video, you’ll learn how UBC Library Research Guides can help you find other good sources of information.

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Welcome to Research Skills for Engineering Students module 5, part 4, academic databases. In this video, you’ll learn about UBC Library Research Guides, and how they can help you find the best resources for your subject.
UBC Library research guides

*Compendex* and *Web of Science* are good databases to use in your engineering research, but there are other databases that may hold specialized information. Eventually, you will become familiar with the databases for your area of study, and you can search for them directly through the **Indexes and Databases** tab on the UBC Library homepage.

If you don’t know which databases to use, [UBC Library Research Guides](https://research.ubc.ca) can help! Research Guides provide recommended resources for each subject taught at UBC. They are a great place to start when you are new to a subject.

To access the UBC Library Research Guides, click the arrow beside **Get Research Help** on the top menu bar of the UBC Library homepage. Select **Research Guides**.

Here, you can browse all subjects taught at UBC. For example, we could expand the **Engineering & Applied Science** section to see all available guides. Alternatively, you can search for a subject within the Research Guides page.

On a research guide, you’ll see information about the subject librarian(s), who are research experts in specific subject areas. They are the best people to contact if you need help or have questions about any resources within the guide.

Key resources for the subject area will be found on the main page of the guide. Along the top of the guide, you’ll see a number of tabs that list different types of material. Click the **Articles** tab to see a list of recommended databases for your subject area. For example, in civil engineering, we can see that core databases are *Compendex* and *Web of Science*. There are other key databases for civil engineering, such as the *ASCE Research Library*.

There are many other specialized databases and helpful resources within each research guide. Explore the tabs and links within, and [ask a librarian](https://research.ubc.ca) for help if needed!

That concludes module 5, academic databases. In the next module, you’ll learn what standards and patents are, why they’re important, and some of the best ways to locate them.