

# National University

of Computer and Emerging Sciences

<b>Department</b>	Computer Science	<b>Dept. Code</b>	CS
<b>Course Title</b>	Technical and Business Writing	<b>Course Code</b>	SS2007
<b>Pre-requisite(s)</b>	SS1014	<b>Credit Hrs.</b>	3
<b>Course Objective:</b>	The purpose of this course is to enable students to understand the definition and the style of technical communication. The students will learn how to produce effective technical documents, like, reports, user manuals, specification, etc. in business and industry. They will learn the universally accepted and international standards of technical communication. Using principles of analyzing and planning to meet the reader's informational needs, students produce proposals, instructions and the various types of informative and persuasive reports used in organizations. In this way, they will develop skills necessary for effective performance in professional life.		

PLO	Program Learning Outcome (PLO) Statement		
10	Communication	Communicate effectively on complex computing activities with the computing community and with society at large.	
12	Life-long Learning	Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological changes.	

CLO	Course Learning Outcome (CLO)	Domain	Taxonomy Level	PLO	Tools
01	Utilize efficient writing style for producing an effective technical document.	Cognitive	3	10	A, M, Q
02	Compose reports for effective performance in professional life.	Cognitive	6	10	A, F, CA, Q
03	Design, document, and develop a research project.	Cognitive	6	12	RP, M, F, Q

Tool: A = Assignment, M = Midterm, F=Final, CA =Class Activity ,RP = Research Project

<b>Text Book(s)</b>	<b>Title</b>	Technical Communication and its applications
	<b>Author</b>	Jerome N. Borowick
	<b>Publisher</b>	Prentice Hall
<b>Ref. Book(s)</b>	<b>Title</b>	Technical Writing
	<b>Author</b>	John M. Lannon
	<b>Publisher</b>	Scott Foresman & Co.
	<b>Title</b>	Writing for Computer Science
	<b>Author</b>	Justin Zobel.
	<b>Publisher</b>	Springer.

Assessments	% Marks		
1. Assignments	7 %		
2. Quizzes	4 %	5. Mid-Terms	30 %
3. Final Project	5+2 %	6. Final Exam	50 %
4. Class Participation	2 %	<b>Total:-</b>	<b>100</b>

Weeks	Contents/Topics	CLOs	AI Tools for Students (Guided & Ethical Use)	Assessment Tools
01	<ul style="list-style-type: none"> <li>Orientation class</li> <li>Technical Writing: Definitions, History, Purposes, Functions, Defining Characteristics</li> </ul>	1	<b>ChatGPT</b> (definitions & examples), <b>Gemini</b> (comparison of definitions)	A1, M1
02	<ul style="list-style-type: none"> <li>The Technical Style: Clarity, Precision, Objectivity, Simplicity, &amp; Economy</li> </ul>	1	<b>Hemingway Editor</b> , <b>Grammarly Free</b> (clarity & conciseness checks)	A1, M1
03	<ul style="list-style-type: none"> <li>The Technical Writing Process- Purpose analysis &amp; Audience Analysis</li> <li>Data Collection &amp; Analysis- Primary &amp; Sources, Qualitative &amp; Quantitative Data</li> </ul> <p><b>Quiz 1 from topics of week 1 &amp; 2.</b></p>	1	<b>ChatGPT</b> (audience analysis prompts), <b>Google Forms</b> (survey drafts)	A2, M1
04	<ul style="list-style-type: none"> <li>Constructing Effective Paragraphs for the technical prose</li> <li>Writing Synthesis Essay</li> <li>Introduction to Citation and Referencing</li> </ul> <p><b>Class Assignment 1: Synthesis Essay (Deadline: week 5)</b></p>	1	<b>Zotero</b> , <b>Scite.ai</b> , <b>ChatGPT</b> (idea integration, not writing)	A1, M1
05	<ul style="list-style-type: none"> <li>How to write instructions in user guides</li> <li><b>Assignment 2: Making a User guide (Deadline: week 8)</b></li> </ul>	2	<b>Notion AI</b> , <b>Canva Docs</b> , <b>ChatGPT</b> (step ordering & clarity)	A2, F
06	<b>MID 1</b>			
07	<ul style="list-style-type: none"> <li>CV/Resume Writing</li> <li>Cover Letters</li> <li><b>Assignment 3: Resume writing (Deadline: week 10)</b></li> </ul>	2	<b>Resume Worded</b> , <b>Grammarly</b> , <b>ChatGPT</b> (bullet improvement)	A3, M2
08	<ul style="list-style-type: none"> <li>How to read a Research Paper</li> <li>Introduction to Scientific Research</li> <li>Research Proposal</li> </ul>	3	<b>Elicit.org</b> , <b>Research Rabbit</b> , <b>ChatGPT</b> (proposal outlines)	FP, M2
09	<ul style="list-style-type: none"> <li>The Technical Report: Writing the Introduction and Literature Review Sections</li> </ul>	3	<b>Connected Papers</b> , <b>Scite.ai</b> , <b>ChatGPT</b> (gap identification)	FP, M2,F
10	<ul style="list-style-type: none"> <li>Technical Reports: Method, Results, Conclusion and Recommendation Sections</li> </ul>	3	<b>Grammarly</b> , <b>ChatGPT</b> (section differentiation & tone)	FP, M2
11	<ul style="list-style-type: none"> <li><b>Quiz 2 from topics of week 8, 9, &amp; 10.</b></li> <li>Preparing Prefatory Parts for Technical Reports: Title Page, Table of Contents, Letter of Transmittal, Abstract, &amp; Executive Summary</li> </ul>	3	<b>Canva Docs</b> , <b>ChatGPT</b> (abstract vs executive summary)	FP, M2
12	<b>MID-II</b>			
13	<ul style="list-style-type: none"> <li>Supplementary Parts</li> <li>Short Survey Report</li> </ul>	3 2	<b>Google Forms</b> , <b>Excel AI</b> , <b>ChatGPT</b> (data interpretation)	F
14	<ul style="list-style-type: none"> <li>Feasibility Studies (<b>Class Participation 1-Activity</b>)</li> <li>Progress Reports (<b>Class Participation 2- Activity</b>)</li> </ul>	2	<b>Notion AI</b> , <b>ChatGPT</b> (planning & structuring reports)	F, CP
15	<ul style="list-style-type: none"> <li>Technical Proposals (<b>Class Participation 3- Activity</b>)</li> <li>Professional Emails (<b>Class Participation 4- Activity</b>)</li> </ul>	2	<b>Grammarly</b> , <b>Outlook Copilot</b> , <b>ChatGPT</b> (tone & clarity)	F, CP
16	<ul style="list-style-type: none"> <li>Revision</li> <li>Project Presentation</li> </ul>	3	<b>Canva</b> , <b>Gamma AI</b> , <b>ChatGPT</b> (presentation rehearsal)	F, CP

## **Responsible Use of AI Tools in Technical & Business Writing (SS2007)**

This course allows guided and ethical use of Artificial Intelligence (AI) tools to support learning, clarity, and revision. AI is a learning assistant, not a replacement for student thinking or writing.

### **Permitted Uses**

#### **Students may use AI tools for:**

- Brainstorming ideas and outlines
- Understanding writing formats (reports, proposals, emails, resumes)
- Improving clarity, grammar, coherence, and tone
- Summarizing sources after reading them independently
- Checking structure and logical flow
- Preparing presentations and visual aids

### **Prohibited Uses**

#### **Students may NOT:**

- Submit AI-generated text as their own work
- Use AI to write full assignments, reports, or essays
- Use AI during quizzes, midterms, or exams
- Bypass reading, research, or drafting processes

### **Academic Integrity**

- All submitted work must reflect the student's own ideas, organization, and voice
- Excessive or unethical AI use may result in penalties under university plagiarism policies
- Students may be asked to explain or defend their written work orally

### **Rule of Thumb:**

*If AI helps you think → allowed*

*If AI thinks for you → not allowed*

## The Four Language Skills:

Receptive	Productive
Listening and Reading	Speaking and Writing

## Writing:

A Non-Productive Activity	Productive Activity
The writer is not the producer of the messages that he/she is writing. S/he is using the skill to record or store messages coming from an external source.	The writer him/herself is the producer of the messages that s/he is writing.

### The Importance of Writing:

- It helps you record history.
- It helps you transmit and preserve religious and cultural values, ideologies, and views.
- It helps us guide, instruct, etc.
- It helps preserve a particular language through codification.
- It is the most appropriate medium of communication in a great majority of cases.
- It makes things permanent and long lasting. Word of mouth is not considered reliable, but the written word carries immense power.

### Genres of Writing

Fiction	Non-Fiction
Drama	Essays
Poetry	Reports
Novel	Research papers
Novelette	Memos
Novella	Articles
Short story	Editorials
	Reviews
	Letters

### Types of Writings

Type of Writing	Example	Trait
Creative/ Literary writing	Poems, plays, stories	Connotative and expressive words, fictional characters, imagery, and plots
	Narratives, descriptions	Subjective, based on personal experience, connotative and expressive words
Expository/ Academic Writing	Comparison/contrast, analysis, cause/effect, argument/persuasion	Objective, connotative and denotative words
Journalism	News stories, features, Editorials	Objective, written from factual observation, short sentences and paragraphs, some connotative but more denotative words
Technical Writing	Memos, letters, reports, instructions, résumés, web pages	Objective, written about products or services, short sentences and paragraphs, denotative words

### Consider the following descriptions for a shoe

<b>Technical Specifications for Manufacturing Tennis Shoes</b>	<b>ODE TO A SHOE</b>
<p>The D40 Slammer Tennis Shoe will be manufactured to the following specifications:</p> <p><b>Sole:</b> Neoprene rubber #345 white enameled paint 1.589" high Slammer waffle-textured©</p> <p><b>Uppers:</b> Blue canvas</p> <p><b>Tongue:</b> White canvas Oval Slammer© logo heat pressure sealed, centered .50" from all sides</p> <p><b>Laces:</b> 15" long ,100% cotton</p> <p><b>Aglets:</b> Clear poly acetate plastic #290</p> <p><b>Weight:</b> 1 lb. 6 oz.</p>	<p>My son's tennis shoes rest temporarily in a heap against the kitchen door, their laces soiled, their tongues hanging out like exhausted terriers.</p> <p>The soles, worn down on the insides from sliding into second, are green, the shades of summer.</p> <p>Canvas exteriors, once pristine white, are the colors of the rainbow— sun bleached, mud splattered, rained on, ketchup and mustard adorned, each shoe shouting a child's joyous exuberance: "I'm alive!"</p>

### **Difference Between Technical and Academic Writing**

<b>Technical</b>	<b>Academic</b>
<ol style="list-style-type: none"> <li>1. Has a practical role on the job.</li> <li>2. Done by an informed writer for uninformed reader.</li> <li>3. Often aims at many readers.</li> <li>4. Objective in nature.</li> </ol>	<ol style="list-style-type: none"> <li>1. Aims only to display your knowledge.</li> <li>2. Done by a student for the teacher.</li> <li>3. Aims to inform/persuade only one person: usually the teacher.</li> <li>4. Can be subjective</li> </ol>

### **Writing the Technical Prose**

The technical prose is informational, defining, and instructional in nature. While writing the technical prose, you may be required to do one or more of the following.

1. Explaining
2. Description
3. Comparison
4. Following chronologies (series of events); for example, when discussing historical background and development of things/concepts over the period of time, writing steps in a procedure, etc.
5. Analysis and evaluation
6. Calculations
7. Referencing and citing
8. Using real or hypothetical support material such as, facts and figures, statistics, events, quotations, insightful observations, analogies, metaphors and similes

## **What is Technical Writing?**

It is a long-established professional activity that can be defined as a specialized field of communication whose purpose is to convey technical and scientific information and ideas accurately and efficiently.

It is a method of communication which deals with subjects in.

1. Engineering
2. Business
3. Trade
4. Government
5. Technology and Science

"The goal of technical writing is to enable readers to use a technology or understand a process or concept. Because the subject matter is more important than the writer's voice, technical writing style uses an objective, not a subjective tone. The writing style is direct and utilitarian, emphasizing exactness and clarity rather than elegance or allusiveness. A technical writer uses figurative language only when a figure of speech would facilitate understanding."

"Anyone who has ever assembled a bookshelf, tried to operate a DVD player, or read an owner's manual has encountered technical writing. This type of writing aims to provide technical, business, or educational information in a way that helps readers understand a subject. It is stylistically different from creative writing and is often primarily informative."

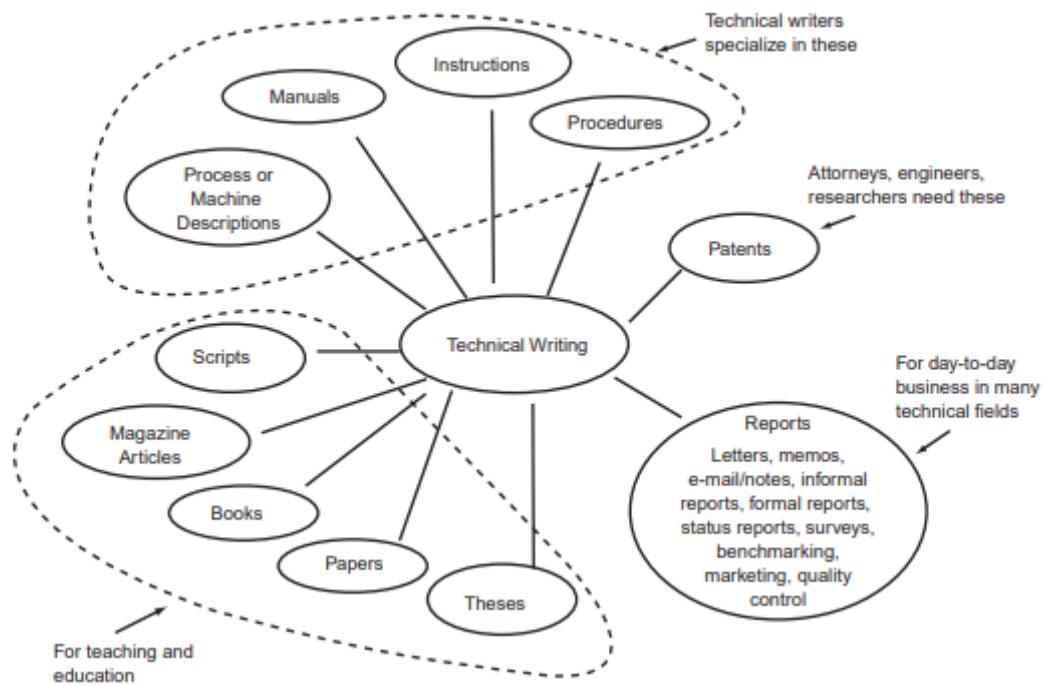
TECHNICAL WRITING is a broad term that encompasses a wide variety of documents in science, engineering, and the skilled trades. The major types of documents in technical writing can be grouped into four major categories:

- Reports and communications in day-to-day business
  - Technical papers, magazine articles, books, and theses for purposes of education, teaching, and the sharing of information and knowledge
  - Patents
  - Operational manuals, instructions, or procedures
- Most technical writing in day-to-day business involves the preparation of various "reports". Writing reports is common for many technical people because reports are a major part of the development and application of technology. Very few companies pay technical professionals a salary without written words to implement and evaluate what has been worked on or developed. For example, if an engineer spends a year developing a new transmission for a car, several types of reports are needed for the design, evaluation, and implementation of the new component. Engineering must also report to management on the viability of design, costs, and work objectives. This usually requires a written document and related engineering drawings—a report. A second category of technical writing includes documents for teaching and education (Fig. 1.1) in the form of scripts, magazine articles, books, papers, and degree theses. Scripts for videos, movies, magazine articles, or multimedia presentations are most often written and edited by professionals in these fields. Books on technical topics are most often written by academicians, although technical professionals occasionally may write an entire book in their area of experience and knowledge. Writing a book obviously requires much more discipline than the writing of reports, but it still requires the clarity of presentation and purpose as in the reports and papers of day-to-day business. The key difference is that books are intended for a larger audience and should have unique and compelling features for the readers. Papers and theses are more common forms of educational or informational documents written by technical professionals. Of course, many people in science and engineering write theses. However, they usually only do one per degree, and the formal writing style and related details are almost always rigorously dictated by the school involved. Papers are the other category in the grouping of types of technical writing that could be considered to be teaching or educational. Another category of technical writing is for manuals, instructions, and procedures (Fig. 1.1). This form of specialized writing is not addressed in this book because these kinds of documents often have

legal/liability implications and are best left to trained technical writers. For example, if you invent a novel type of bicycle seat, a user who got hurt because he installed the seat pointing aft could sue you if you did not include in the installation and use manual a statement like the following:

*“The prow of the seat (point A in Fig. 6) should be positioned pointing at the handlebars (Fig. 7).”*

Similar liability could be incurred by overlooking a safety or environmental concern in writing a heat treating procedure for a gear. Finally, patents require another key type of document in technical writing. Lawyers usually write patents, but not without lots of writing and searching on the part of the applicant.



## History of Technical Writing:

- Prehistoric cave paintings in France and Spain that illustrate primitive man's techniques for hunting buffalo.
- Technical writing from Babylonians which has survived in the form of clay tablets contains information about their accomplishments in astronomy, mathematics, agriculture, instructions manuals for making beer, etc.
- Ancient Egyptian technical writing on papyrus in the fields of medicine and mathematics.
- More prolific technical writers were the ancient Greeks. Their writings on mathematics, physical sciences, biology, psychology, literature, etc provided the foundations for the current modern Western European and American civilization.
- Instruction books or manuals is an important area in technical writing and it started in the 16<sup>th</sup> century when the first manual on military weapons was written.
- World War II brought a tremendous speed-up in research and technology. As a result of this, the field of technical writing grew up almost overnight. The country needed a quick and efficient way to explain new scientific devices and weapons to the non-scientists and soldiers who were going to use them.

- Today's modern world more than ever needs technical writers to explain how to use the new systems, and consumer products and services, spawned by recent advances in agriculture, biology, chemistry, computer science, engineering, and physics.

## **Genres of Technical Writing:**

1. Instruction manuals
2. Procedure Guidelines
3. Reports
4. Specifications
5. Proposals
6. CV/Resumes
7. Business correspondence (letters and memos)
8. Research papers and articles
9. Other technical documents

## **The Importance of Technical Writing:**

In a world of rushing and pressure to save time, writing documents seems slow and time consuming. Why write a letter or a memo if you can make a quick phone call? Why spend time thinking about how to put into words information that can be transmitted spontaneously without the extra effort of heeding syntax and punctuation? This logical reasoning fails, though, when we come to consider the type of documents technical writers need to develop as well as the audience they are addressed to. On many occasions, communication is not just from one emitter to one receiver but rather from one to many, as is the case of memos addressed to company staff, or a report meant to be read by more than one person, for example. In addition, most documents generated in the technical field include information that cannot be easily transmitted unless it is orderly displayed on a document. In other words, oral communication may fall short when we need to transmit the information technical documents require. Hence, writing skills can be considered an important factor in the technical and scientific field because:

1. *In many different types of work, writing constitutes an important part of the everyday workload.* In a company, people write to inform about a project or activity (progress reports), to help managers in decision-making (recommendation reports), to communicate within the organization (memos), to ask questions (inquiry letters) and to contact colleagues, distributors, and mates in the same workplace (email messages). These various tasks reveal that writing is a key activity for many technical professionals.

2. *They facilitate communication with co-workers, clients and supervisors, that is, inside and outside the workplace.* Engineers and scientists' writing skills must be of a high standard in order to effectively communicate with the people with whom they work. It is not enough for them to be technically good, they must be skilful in communicating what they are doing and why it is important. As a last resort, their technical and professional value will very much depend on their capacity to convince others of the importance of their work.

3. *They are necessary for a successful career.* Organizations know the advantages of a well written document since the way they construct their documents reflects their image. Poorly written documents will reveal not only writers' inefficiency but also organizations' lack of seriousness. Thus, engineers who can communicate their thoughts clearly and efficiently are bound to be promoted to more challenging positions. Additionally, being good at written communication skills (in whatever

language) is likely to act as an added value that enhances your curriculum vitae and helps you stand out from other applicants in a job selection process.

4. Writing skills contribute to saving time and money. Good technical writing saves time and, therefore, money. If you create a document, a report, for example, for your superior, which is clear and easy to understand, no time will be wasted on pondering the meaning.

Technologists, engineers, scientists, etc perform functions like: design, analyze, research, manufacture or construct, test, and manage. The result of their work is discussed in reports and other documents. In most of the cases, these reports and documents are one's only form of communication with clients, government agencies, managers, and professionals at other facilities and companies.

The importance of technical writing can be seen in a variety of applications, both in consumer products as well as the industrial environment. Without clear, precise writing that outlines the specifications and directions for use, products can become meaningless at best and dangerous at worst. Technical writing provides a context to products and processes, and allows them to be used safely and as intended. While it may not be impossible to construct and use equipment and processes without reading the technical documents, technical writing provides some assurances that the product is being used as intended.

In the industrial field, the importance of technical writing can be seen in a number of different applications, which includes in the pitching of new products or ideas. Not only is it important to be able to write technical documents clearly for investors and management, if introducing a new product or piece of equipment, it is a requirement if the company or individual is to apply for a patent. Technical writing must clearly demonstrate the purpose of the machine or product, as well as specifications such as its dimensions, individual parts, and power source, if applicable.

In addition to the unveiling of new products, the importance of technical writing is also seen in the use of more traditional products and processes. While trainers may help employees learn various pieces of equipment in an industrial setting, technical manuals can help when unusual situations occur, or serve as a comprehensive reference in other situations. This information is readily available, even if someone with more expertise or experience is not. Technical writing documents can reduce downtime or help to prevent it altogether.

For end users, or home consumers, the importance of technical writing can be seen in the documents that come with various products. For example, putting together a bicycle, pieces of furniture, or installing appliances may take some level of expertise without proper directions; this might even result in irreparably damaging the product. Technical writing helps by explaining the process in detail in simple steps, and provides an easy-to-understand list of tools and alternatives. The documents also provide safety information related to the product.

Technical writing can help individuals save time and money, while at the same time stimulating the economy. Without good technical writing, individuals and businesses could be discouraged from investing in new products and processes. Patents may not be granted because of undocumented similarities to other known products. Thus, the importance of technical writing is not only seen in the money it helps to generate, but also by the convenience and safety it creates for readers.

## **Common Purposes of Technical Writing:**

- To give information (It is the primary purpose of TW)
- To analyze and interpret events and their implications
- To persuade and influence decisions

## **Functions of Technical Writing:**

1. To serve as basis for management decisions
2. To furnish needed information
3. To give instructions
4. To explain techniques
5. To report achievements
6. To analyze problem areas
7. To determine design and system requirement
8. To serve as basis for public relation
9. To provide report to stockholders of companies
10. To develop a product
11. To provide service
12. To record business proposals
13. To procure business through proposals

# **WRITING IN COMPUTER SCIENCE**

Any graduate's career starts from CV/resume and cover letter writing. For a successful career, computer science graduates require well-developed technical skills, good communication skills, and sound background knowledge of their field. Technical writing is perhaps the most important skill and ability. Graduates will have to engage in writing different types of technical documents.

There are many documentation types found in the Computer Science industry. It is important to understand that many of the documentation types will follow a certain format or standard. Always check with the company or client to verify the required format. The main types of documents used in the career of a computer scientist are:

### **1. Project Proposals**

Project proposals are used to introduce projects to clients or management. They identify a specific problem and state how that problem will be solved.

The purpose of the proposal is to convince your audience that you have a viable solution to a specific problem. Proposals should briefly describe the nature of the client's business and what the client's needs are. Then describe how the software will meet those needs. The level of detail needed will be dictated by the size of the project, but proposals should be rough estimates of possible projects. Proposals for small projects may be very brief, a page or two, while proposals for large expensive projects will need to be much more detailed and thorough. A refined description of the project will come in future documents.

### **2. Project Overview Specification (POS)**

A POS is the first step in refining the project described in the proposal. The purpose here is to provide an overview of the project to the client. The intent is to create a mutual understanding between the development team and the client of what is expected over the course of the project.

The main sections of the POS include an executive summary of the document, followed by a description of the client and the client's needs. This serves to let the client know that the development team understands the client's business and provides a clear statement of what the problem is. The POS also defines the goals and vision of the project. In general terms it should describe how the project will fulfill the client's needs. The POS will introduce how the project will

be managed and include an estimated schedule and budget. Finally, the POS concludes with a listing of assumptions and constraints that may limit development. Constraints can include time, cost, or technical limitations. It is important to define constraints in order establish the project's scope and final expectations. Without limiting factors the project may never finish.

### **3. Software Project Management Plan (SPMP)**

The SPMP is used to describe the development team's management process for the project. It describes the project's organization and control processes. This does not describe the software itself, only the processes for which it will be managed. Things to include will be potential risks and how to deal with them, project schedules, budget, and software tools that will be used during development.

The SPMP focuses on the organization of the project. The process model should be clearly specified in order to show the flow of the project phases (see figure right). Phases are then broken down into the necessary tasks needed to complete each phase. Weekly schedules for each phase are set in order to ensure project progression. The SPMP is used as a guide to control and manage the project.

### **4. Software Requirements Specification (SRS)**

This is where we completely define the functionality of the software. The SRS is a refined description of the software's intended uses as well as its non-functional requirements. Intended uses are specified with use-cases. Each use-case describes a scenario for which a user will interact with the software. A use-case may specify the steps needed in order for an administrator to manage users on a social networking site, for example (see diagram right). The use-case steps must be described completely and precisely. All possible scenarios should be defined. These requirements will be used to determine the design of the software.

Non-functional requirements involve things like security, performance, and reliability. The SRS serves as a kind of contract between the developers and the client detailing the intended behavior of the finished product.

Included are definitions of the data elements, data structures, or data tables that will be used in the design. This is known as the data dictionary and should clearly define the type, purpose, and description of each element.

### **5. Software Design Specification (SDS) or Software Design Description (SDD)**

The purpose of the SDS is to give the development team a guideline as to how the project is to be implemented. It describes the system's architecture; how the different modules of the software will interact with each other. Diagrams or figures are often used to provide visual descriptions of how components relate to one another. The SDS also reveals to other developers what design decisions were made. This makes it easier to modify or maintain the software in the future.

In addition to the system architecture, the SDS specifies the interface design. This is the portion of the system that the user will be interacting with. It includes prototypes of how a graphical interface may look. Multiple prototypes can be produced until a final interface layout is adopted. Also included are detailed definitions for each component of the software. Each component will relate to each of the use-cases previously described in the SRS. The components will contain the actual code needed to implement those use-cases.

### **6. System Test Specification (STS) and System Test Report (STR)**

The purpose of the STS is to describe the plan for testing the software, and to specify the test cases and test procedures necessary to demonstrate that the software satisfies the requirements as specified in the project's System Requirements Specification document.

This provides an organized plan for the developers to follow in order to test the program thoroughly. It also allows other developers to be able to confirm what test cases have or have not been performed. The actual results of the test cases can be used to generate a System Test Report. The results are then evaluated to determine if the software has adequately satisfied the requirements.

## 7. User Manuals

User manuals are guides that instruct users on how to use the software. They should include step-by-step instructions that are easy to follow.

User guides are instruction training manuals written for novice end-users to help them with products ranging from consumer products such as electronics or appliances to B2B SaaS tools and solutions. These manuals are user-friendly and well-illustrated to highlight common issues and features.

Additionally, technical writers must collaborate with engineers, programmers, and product designers to cover all the bases.

## 8. Code Comments

Code comments allow other developers the ability to understand the intended behavior and purpose of your code. Other developers need to be able to understand your code in order to modify and maintain it. Without sufficient comments this task can become incredibly difficult and time consuming.

## 9. Memoranda

Memoranda or memos are used in order to fulfill a variety of objectives. The style and purpose of the memo will depend on objective. Objectives can range from an instructor wants your reaction to a journal article to a manager needs to inform the development team about a policy change. Memos should be limited to a few pages and should have a clear purpose. Usually the format of a memo is standardized within a company with its own heading style and letterhead.

10. Technical Report
11. Simple technical information report
12. Technical Evaluation Reports
13. Technical Recommendation Reports

Good writing is critical at all levels of software development. At the conceptual level, one has to be able to express ideas to the customers. You need to be able to justify your approach and design. Also, computer users have to be able to make use of your program, so you need to be clear in your instructions for use and maintenance. Finally, your documentation both inside and outside your program should be easy to understand.

First, Clarity and organization are vital when you write for a technical field. When you are writing a technical report on a system you have developed, you have to be able to explain how your system is different (or better or otherwise important) when compared to other systems available. You must also explain the significance of what you have accomplished, the details of your accomplishments, and your future work. (In a field as dynamic as Computer Science, there are always avenues for improvement.)

Second: In software development, the ability to summarize your work so that your customer or audience can follow your logic is important. Also, programs themselves are logically sequenced to accomplish certain things. If you organize your program poorly, you won't get the desired results!

Third: Mechanics are important as well, particularly when writing a program. For example, while another person may have no trouble understanding you if you have subject-verb disagreement, a

compiler (which turns a program into executable code) is not so forgiving. Proper syntax is essential to the creation of a working system.

*All* careers in Computer Science require writing. The different types of writing your position might demand is detailed above (program code, documentation, communication with customers, etc.). You must be able to communicate effectively through writing to succeed in this field.

### **Academic & Technical Writing: a comparison:**

- Thesis or hypothesis initiates the text
- Cited evidence serves as the body of the text
- Conclusion of summation and ideas for further research closes the text

<b>Academic Writing</b>	<b>Business &amp; Technical Writing</b>
Prose is primary writing mode.	Lists, bullets, and short paragraphs are primary writing mode.
Thesis is in opening paragraphs.	Thesis is in paragraph, phrase, or heading.
Ideas are divided by paragraph.	Ideas are divided by paragraphs, lists, or sections.
Sources are a permanent record.	Sources are only as permanent as the message.
Paragraphs are preferred over lists.	Lists are preferred over paragraphs.
Sentence diversity is valued.	Parallelism and repeated patterns are valued.

### **Difference between Technical and Literary Writing:**

<b>Point of Difference</b>	<b>Technical Writing</b>	<b>Literary Writing</b>
<b>Rule-governed</b>	It has its own set of rules and practices. It presents a formal order or structure for conveying ideas.	It is experimental.
<b>Organization</b>	It is highly well-organized and logically structured. It follows the patterns and conventions for different text types strictly.	It can be loosely organized.
<b>Clarity</b>	It possesses high degree of clarity. All messages are delivered directly and explicitly. Writers' purpose and theme is clearly indicated in the very first paragraph.	It can be implicit and covert. It may challenge the reader's intellect to discover the writer's objectives and key ideas.
<b>Grammatical Accuracy</b>	It adheres to traditional conventions of punctuation, grammar, and spelling completely.	It tries to do the same.
<b>Tone and Style</b>	It has a formal tone. The writer appears objective, tolerant, and serious. Sentences may be complex.	It can have variety of tones and styles, like, formal, informal, humorous, sarcastic, pensive, meditative, poetic, emotional, nostalgic, friendly, casual, conversational, sophisticated, complicated, etc.

<b>Stylistic Devices</b>	It is more straight forward and down to earth.	It uses plenty of stylistic devices, like, metaphors, similes, irony, puns, oxymoron, etc.
<b>Vocabulary</b>	It uses standard language in order to develop the formal tone and attitude which is the hallmark of technical writing. It may use technical words.	It can use vocabulary belonging to different language varieties depending on the audience and tone.
<b>Content</b>	It is usually based on factual, straightforward, specialized topics.	It can choose from a wide variety of topics, ranging from very important to less significant things in life.
<b>Authenticity</b>	It always informs readers about the sources from where it collects information.	Sources might be clear, or unclear, or sometimes not mentioned at all.
<b>Use of Visual Aids</b>	It uses tables, graphs, figures to facilitate comprehension of facts, statistics, and data	Pictures might be used, but rarely.
<b>Summary</b>	Informative, unemotional, limited interpretation possible.	Entertains, amuses, appeals to imagination and emotions. Suggestive, creative, dramatic, imaginative, metaphoric. Various interpretations possible.

**Activity 1: State whether the following statements are true or false.**

1. Technical writing is limited to science and technology only.
2. Technical writing skills have to be learnt in order to develop.
3. Technical communication is a unique distinctive type of communication with its own conventions and trends.
4. Communication with clients can be termed as technical communication.
5. Technical writing is a type of communication that never happened before the industrial revolution.

**Activity 2: Provide brief answers.**

1. What are the major fields/genres of technical writing?
2. Why are good technical writing skills crucial for software engineers?
3. What is the primary purpose of technical writing?
4. Define technical writing in your own words.

**Activity 3: Compare and contrast the texts given below. How are they different from each other despite describing the same object?**

**TEXT A**

One enters the palatial room through an elegantly carved maple door to reveal the French provincial furniture of another century. The plush beige carpet makes one want to run and dance barefoot.

**TEXT B**

The entrance to the 24-ft room is a 36-in. by 80-in. maple door decorated with a carved family crest. The floor has a beige nylon carpet with a 1-in. pad. The furniture is French provincial.

**Activity 4: Put the following characteristics under the correct heading in the boxes below.**

- a. The organization is more sequential and systematic.
- b. The purpose is usually to entertain, provoke, captivate, or express.
- c. The tone is subjective.
- d. The content is factual.
- e. A variety of styles can be employed.
- f. Specialized vocabulary and a formal standard language is used.
- g. Arbitrary and artistic

Technical Writing	Literary Writing

**Activity 5: Read the text below and comment on its style.**

1. The aqueous self-assembly of oligopeptide-flanked #-conjugated molecules into discrete one-dimensional nanostructures is described. Unique to these molecules is the fact that the #-conjugated unit has been directly embedded within the peptide backbone by way of a synthetic amino acid with #-functionality that is compatible with standard Fmoc-based peptide synthesis. The peptide-based molecular design enforces intimate #\$/# communication within the aggregate after charge-screening and self-assembly, making these nanostructures attractive for optical or electronic applications in biological environments. The synthesis and assembly are reported along with spectroscopic and morphological characterization of the new nano materials.
2. The sky was clear and dark, and a slight breeze stirred the air. A silvery cloud drifted over the mountains that surrounded him, its edges glowing with ruddy light cast from the harvest moon cradled between two peaks. Streams flowed down the mountains from stolid glaciers and glistening snowpack. A brooding mist crept along the valley's floor, almost thick enough to obscure his feet.

**Activity 6: Can you identify which genres the following extracts are taken from?**

**Tip:**

Study the elements of the text to identify the genres. Elements are **tone, attitude, the author's personality, style, treatment of subject matter, and overall impression.**

## **EXTRACT 1**

In Egypt, the words "street food" and "gourmet" don't often go hand in hand. Street food is not about style; it's meant to be quick, cheap and filling. However Chris Khalifa, a 30-year-old owner of Zooba cafe in Cairo, has tried to change that. He saw a trend elsewhere in the world: chefs hit the streets and serve dishes out of food trucks.

"I noticed no one had ever tried to do this with Egyptian street food," said Khalifa. "I try to create a brand around a more gourmet Egyptian street food."

But instead bringing gourmet food to the street, [Zooba](#) turns street food into fine dining. Located in Cairo's up-market Zamalek neighborhood, the cafe serves classic street fare like koshari and falafel with a new twist. The dishes, like spinach-infused "baladi" bread or sweet potatoes roasted with a blowtorch, are prepared by professionally trained chefs, using top-quality ingredients.

## **EXTRACT 2**

**Probably the most difficult problem for people living alone is dealing with feelings of loneliness.** First, they have to understand the feeling. Some people confuse being alone with feeling lonely. They need to remember that unhappily married people can feel very lonely with spouses, and anyone can suffer from loneliness in a room crowded with friends. Second, people living alone have to fight any tendencies to get depressed. Depression can lead to much unhappiness, including compulsive behavior like overeating or spending too much money. Depression can also drive people to fill the feeling of emptiness by getting into relationships or jobs that they do not truly want. Third, people living alone need to get involved in useful and pleasurable activities, such as volunteering their services to help others.

## **EXTRACT 3**

The sources said nobody, including the owner, could carry out any construction at the site protected under the act that prescribed long prison terms and heavy fines for violators. The repair, restoration and rehabilitation work at the protected site could be carried out only after the advisory committee on cultural affairs, headed by the chief secretary, gave its permission or issued a no-objection certificate, they added.

An advisory committee member said permission/ NOC was required to carry out work at the Clifton heritage site. "No NOC has been issued for this project," he added.

## **EXTRACT 4**

Five score years ago, [a great American](#), in whose symbolic shadow we stand today, signed the [Emancipation Proclamation](#). This momentous decree came as a great beacon light of hope to millions of Negro slaves who had been seared in the flames of withering injustice. It came as a joyous daybreak to end the long night of their captivity.

But one hundred years later, the Negro still is not free. One hundred years later, the life of the Negro is still sadly crippled by the manacles of segregation and the chains of discrimination. One hundred years later, the Negro lives on a lonely island of poverty in the midst of a vast ocean of material prosperity. One hundred years later, the Negro is still languished in the corners of American society and finds himself an exile in his own land. And so we've come here today to dramatize a shameful condition.

## **EXTRACT 5**

1801. - I have just returned from a visit to my landlord - the solitary neighbor that I shall be troubled with. This is certainly a beautiful country! In all England, I do not believe that I could have fixed on a situation so completely removed from the stir of society. A perfect misanthropist's heaven: and Mr. Heathcliff and I are such a suitable pair to divide the desolation between us. A capital fellow! He little imagined how my heart warmed towards him when I beheld his black eyes withdraw so suspiciously under their brows, as I rode up, and when his fingers sheltered themselves, with a jealous resolution, still further in his waistcoat, as I announced my name.

'Mr. Heathcliff?' I said.

A nod was the answer.

'Mr. Lockwood, your new tenant, sir. I do myself the honour of calling as soon as possible after my arrival, to express the hope that I have not inconvenienced you by my perseverance in soliciting the occupation of Thrushcross Grange: I heard yesterday you had had some thoughts - '

'Thrushcross Grange is my own, sir,' he interrupted, wincing. 'I should not allow any one to inconvenience me, if I could hinder it - walk in!

The 'walk in' was uttered with closed teeth, and expressed the sentiment, 'Go to the Deuce:' even the gate over which he leant manifested no sympathising movement to the words; and I think that circumstance determined me to accept the invitation: I felt interested in a man who seemed more exaggeratedly reserved than myself

## **EXTRACT 6**

The battery compartment holds the batteries, the power source for the flashlight. The compartment is cylindrical, 3-1/2 inches long and 1-1/4 inches in diameter, with a coiled metal spring on the interior of the closed end, and a 1/4-inch wide strip of gold-colored metal running along one interior side of the compartment. The compartment holds two 1.5-volt C batteries, in a stacked position, with the negative end of the lowermost battery in contact with the spring, and the positive end of the lowermost battery supporting the negative end of the uppermost battery. The open end of the battery compartment closes with the insertion of the bulb assembly.

## **EXTRACT 7**

In a boiling water reactor, steam is allowed to form directly in the core. The main components of a boiling water reactor are the core control rods, the core shroud and reactor vessel, the recirculation system, the steam separators, and the steam dryers. The core of a boiling water reactor is slightly larger than that of a pressurized water reactor but contains the same elements. The coolant is circulated through the system by the recirculation system that consists of two loops containing pumps external to the reactor vessel and jet pumps inside the vessel. After steam is formed in the reactor vessel, it flows to a series of steam separators

where it is separated from the coolant. The steam then flows through steam dryers where additional drying is done, and then it proceeds to turn a turbo generator. The control rods and reactor vessel function in the same way as in the pressurized water reactor.

## EXTRACT 8

The sun shone brightly over the small village, casting long shadows on the cobblestone streets. Children laughed as they played near the bubbling fountain in the square, their voices blending with the chirping of birds. An elderly man sat on a wooden bench, sketching the scene with delicate strokes of his pencil, while a dog rested at his feet, basking in the warmth.

**Activity 7: Which adjectives do you think can best describe technical writing and technical writers?**

Imaginative/ objective/ dreamy/ sensational/ precise/ straight forward/ subjective/ researcher/ meticulous/ creative/ conformity/ direct/ experimental/ innovative/ exact/ vague/ scrupulous/ dramatic/ sober/ emotional

**Activity 8: What genres of writing do you think the following documents belong to? Choose from the options below.**

- Journalistic
- Academic
- Literary
- Technical

Essay/ poetry/ articles/ press release/ user manuals/ novels/ research papers/ brochures/ reports/ pamphlets/ memorandums/ drama reviews/ feasibility studies/ literature reviews/ instructions.

**Activity 9: Read the following paragraph and identify the genre. Now, rewrite this paragraph in technical writing style:**

The world of computer science is no longer confined to the hum of processors or the glow of screens; it is a vibrant, ever-evolving tapestry of innovation. Emerging fields like quantum computing shimmer with the promise of unraveling mysteries once thought unsolvable, while artificial intelligence dances on the edge of human creativity, painting digital masterpieces and composing symphonies of code. In the shadow of machine learning's infinite possibilities, cybersecurity stands as its shield, battling invisible threats in a boundless virtual realm. These fields, like constellations in the cosmic expanse, invite dreamers and doers to navigate uncharted territories and craft the future.

