



# **GEN 1004 COMMUNICATION SKILLS**

## **Lecture 7: Writing Technical Reports**

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## ELEMENT AND STRUCTURE OF A TECHNICAL REPORT

- 1) Cover Page.
  - 2) Table of contents.
  - 3) List of figures.
  - 4) List of tables.
  - 5) List of abbreviations.
  - 6) List of symbols.
  - 7) Abstract.
  - 8) Introduction.
  - 9) Main Report Body.
  - 10) Conclusion.
  - 11) References.
  - 12) Appendices and Glossary.
- Can be omitted for short reports.
- Front Matter
- Back Matter
-



## Elements of a Cover Page

A cover page should include the following:

- 1) Institution logo. (if existed)
- 2) Institution Name.
- 3) Clear report title.
- 4) Report serial number. (if it is a part of many reports.)
- 5) Name of authors and their affiliations.
- 6) Date.

Below is a sample errata for a cover page, back of title page, and RDP page.

NASA/TM-2016-000000 [Retain original report year and number.]



First Line Title  
Second Line Title  
Third Line Title

*Author*  
Langley Research Center, Hampton, Virginia

An Erratum was added to this report [current] month 20XX

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Month XXXX [Retain original report date.]



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**Notice:** The Arabic numerals are used for numbering a report starting at the introduction section. Front Matter are numbered using Latin numerals.



## List of Figures and Tables

- For long reports like: thesis and dissertation, it is better to include list of figures and list of tables to make it easy for the reader to locate them when one figure or table is cited far from its location.
- For electronic reports, it is better to make any list interactive.
- Descriptions of figures and tables in these list should be clear, informative and exact to their captions.



## EXAMPLE of a LIST OF FIGURES

### List of Illustrations

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### List of Illustrations

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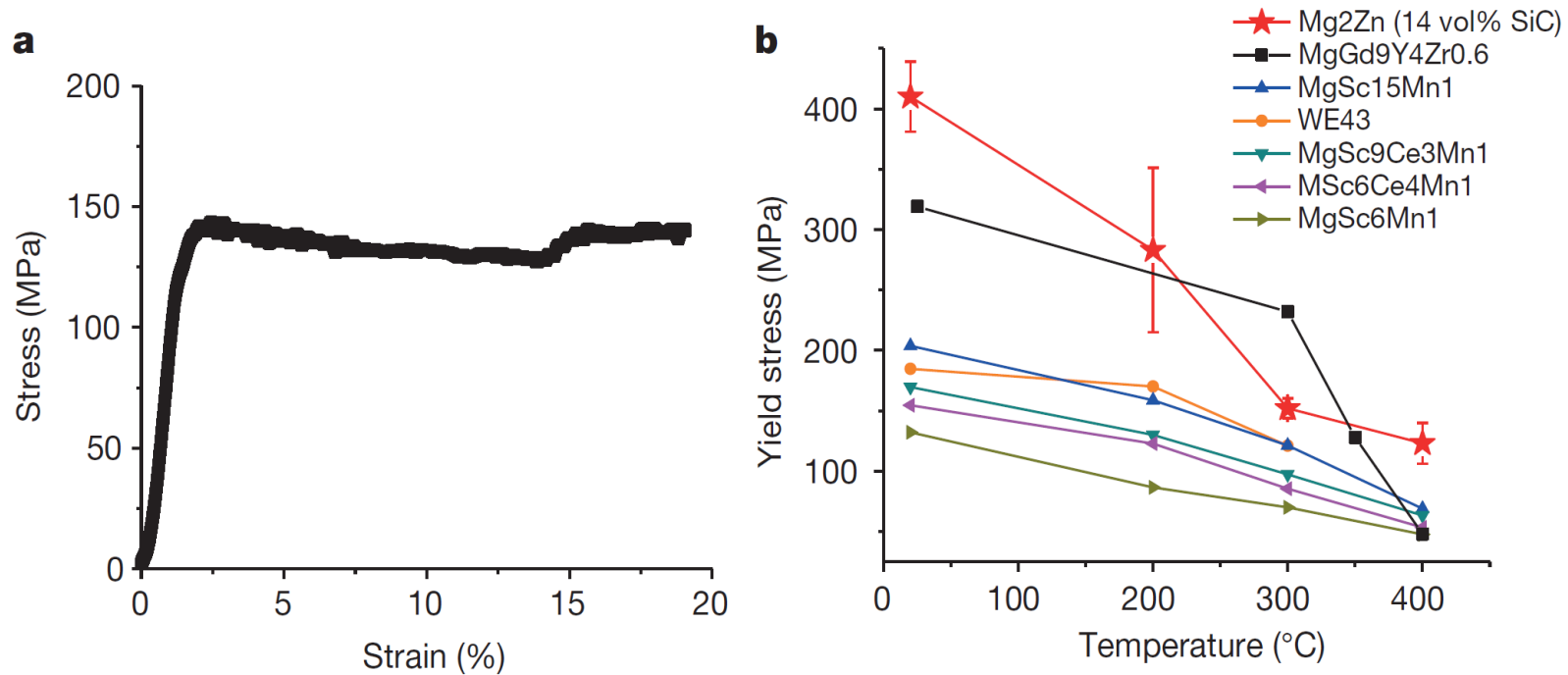


## Guidelines for using Figures and Tables

- Each figure or a table included in the report must be mentioned in the text.
- Positions of figures and tables should be right after the paragraph or the section they are mentioned in.
- Each figure or table must have a caption that clearly describes it. Captions are located below figures and above tables. Captions must contain the figure's or the table's number (e.g. Fig.1 , Table.2.2. )
- Figures containing axes must have a label on each axis that describes it and its units.
- Figures containing multiple curves on the same axes must have a legend that distinguish each curve.



## Example of a Figure



**Figure 4 | Mechanical behaviour of as-solidified sample at elevated temperatures.** **a**, Engineering stress–strain curve of Mg<sub>2</sub>Zn (14 vol% SiC) micropillars at 400 °C. **b**, Yielding stress of Mg<sub>2</sub>Zn (14 vol% SiC) at

elevated temperatures compared with other high-temperature magnesium alloys. Error bars represent s.d. of at least three data sets.





## Abbreviations and Acronyms

- An abbreviation or an acronym is a group of letters that stands for a name or a phrase formed from the initial letters of that name or phrase.
- The difference between abbreviations and acronyms is that acronyms are written and read as a single word, while abbreviations are read as separate letters.

Abbreviations	Acronyms
IBM (International Business Machines)	NASA (National Aeronautics and Space Admiration )
ATM (Automated Teller Machine)	NATO (North Atlantic Treaty Organization)
FAQ (Frequently Asked Questions)	AIDS (Acquired Immune Deficiency Syndrome)
AC (Air conditioner)	SIM card (Subscriber Identification Module)
UFO (unidentified flying object)	Radar (Radio Detection and Ranging)



## Guidelines for using Abbreviations and Acronyms

- The first time an abbreviation or an acronym is used, the full name should be written.

*e.g.* The Federal Communication Commission (**FCC**), which will submit the plan to the Congress, agrees to extend the submission deadline for one week.

-Abbreviation can be separated by dots if each letter stands for a word. American English uses dots while British English omit them.

*e.g.* The US president or The U.S. president.

I will Call Mr. Hussein tomorrow or I will call Mr Hussein tomorrow.



## Guidelines for using Abbreviations and Acronyms

- For Plurals of abbreviations, just add s at the end without apostrophe.  
*e.g.* The CEOs of the invited companies will discuss the development plan.
- If the abbreviation or the acronym is well known and common, then it is not necessary to write the full name even at the first time it is used.  
*e.g.* USA, UK, NASA, Radar, Laser, Mr. , Dr. , 1 p.m. ,



## Symbols

-The meaning of each symbol used in a technical report must be clearly stated when the symbol is first used.

e.g. For a group of points connected by a system of springs, the force vector  $\{\vec{F}\}$  can be written in terms of the displacement vector  $\{\vec{\delta}\}$  and the stiffness matrix  $[K]$  as follows:

$$\{\vec{F}\} = [K]\{\vec{\delta}\} \quad (1)$$

-**Note** that equations should also be numbered.



## Abstract

The first thing that a reader will read is the abstract to determine if the report is of an interest to him. Therefore, abstract should clearly identify the purpose of the report, the information presented in it, the analysis methodology and a brief summary of the results.

## Appendices

Any additional information that may be interesting to readers and it does not need to be included in the report main body should be written in the appendices section at the end of the report. (e.g. derivation of a certain equation)



## Citation and Referencing

- Every time you use or mention a piece of information that is not yours or developed by you, you must clearly indicate the source of this information right after mentioning it.
- Note that even if the information is developed by you, but in a previous report, you should also cite it.
- There are different styles that are available for citation. The most common styles in engineering are the APA and the IEEE.
- One citation style must be used throughout the report.
- If you mention the author's name, then you should use his/her surname.



## Examples of Citations and Referencing

### APA style:

#### Citation

Regarding the analysis of functionally graded CNT-reinforced composites, a comprehensive review can be found in (Liew et al.,2015). The same approach is used by Ghasemi et al. (2014) for the reliability-based optimization of a CNT-reinforced thick cylinder.

#### Referencing

Ghasemi, H., Rafiee, R., Zhuang, X., Muthu, J., & Rabczuk, T. (2014). Uncertainties propagation in metamodel-based probabilistic optimization of CNT/polymer composite structure using stochastic multi-scale modeling. *COMP MATER SCI*, 85(1), 295-305

Liew, K., Lei, Z., & Zhang, L. (2015). Mechanical analysis of functionally graded carbon nanotube reinforced composites: a review. *COMPOS STRUCT*, 120(1), 90-97.



## IEEE Style:

### Citation

Regarding the analysis of functionally graded CNT-reinforced composites, a comprehensive review can be found in [1]. The same approach is used by Ghasemi et al. [2] for the reliability-based optimization of a CNT-reinforced thick cylinder.

### Referencing

[1] K. Liew, Z. Lei and L. Zhang, "Mechanical analysis of functionally graded carbon nanotube reinforced composites: a review," *COMPOS STRUCT*, vol. 120, no. 1, pp. 90-97, 2015.

[2] H. Ghasemi, R. Rafiee, X. Zhuang, J. Muthu and T. Rabczuk, "Uncertainties propagation in metamodel-based probabilistic optimization of CNT/polymer composite structure using stochastic multi-scale modeling," *COMP MATER SCI*, vol. 85, no. 1, pp. 295-305, 2014.





## General Guidelines for Scientific Writing

1) It is recommended to use passive voice instead of active voice:

e.g. The experiment was conducted and the results obtained indicated that ....  
It can be concluded from the graphs that....

2) The writing should be consistent:

2.1) Verb tense consistency; sentences connected by coordinators (for, and, nor, but, or, yet, and so) must have the same verb tense.

e.g. - Advertising can be used to spread a new offer and also indicate how successful the company is.

- We start by analyzing the data and constructing tables.



## 2.2) Consistency in listing:

e.g. this is done by a) selecting the number of codes that researcher think is relevant, b) defining conceptual categories.

## 2.3) Consistency in bullet points:

Each of the points must be grammatically matching the introductory structure and flow smoothly with it.

e.g. the general analysis consists of:

- collecting information.
- trying to identify the main features.
- validating the model.
- defining the features.

Note that the points starts with small letters not capital letters.



## 3) Currencies

3.1) if the name of a currency is shared by two or more countries, you should specify which one.

*e.g.* The total cost will be 2,000 US dollar.

3.2) for international publishing, it is recommended to use a well-known global currency along with the local currency.

*e.g.* The company will establish a factory in Egypt with a starting capital of 1million Egyptian pound (62,000 US dollar).

3.3) currency full name starts with small letters expect if they are at the beginning of a sentence. Abbreviation of a currency is written with all capital letters. (*e.g.* EUR, USD)

3.4) currency symbol comes before the number.

*e.g.* The cost will be \$1000.



## 4) Avoid Redundancy:

e.g. -The leaves exhibited symptoms of bleaching. (Redundant)

-The leaves were bleached. (concise)

-The results were analyzed and indicated that the excessive pressure is the reason of the failure of the tank. (Redundant)

-The results indicated that the excessive pressure led to the tank failure. (concise)

## 5) Scientific sentences should be specific:

e.g. The additional weight caused the stresses to increase. (Vague)

The additional weight caused the stresses to increase by 20%. (Specific)



*End of lecture 7*

*Please read chapter 17 in Ref[5] and chapters  
4,6,8 and 9 in Ref[4]*