(THESIS TITLE: UPPER CASE, TIMES NEW ROMAN, 16 PT, TEXT CENTERED) & (NAME SURNAME, YEAR TO BE WRITTEN IN LATERAL BORDER)

FACULTY OF ARCHITECTURE AND ENGINEERING

EPOKA UNIVERSITY

Approval of the thesis:

THESIS TITLE: UPPERCASE, TIMES NEW ROMAN, 12 PTS, CENTERED

submitted by…… in partial fulfillment of the requirements for the degree of **Doctor of Philosophy in Department of Computer Engineering, Epoka University** by,

Prof. Dr. ……... _____
Dean, Faculty of Architecture and Engineering

Prof. Dr. …….. _____
Head of Department, **Computer Engineering, EPOKA University**

Prof. Dr. …… _____
Supervisor, **……. Dept., EPOKA University**

Prof. Dr. …… _____
Co-Supervisor (if available), **…….. Dept., ……..University**

Examining Committee Members:

Prof. Dr. …….. _____
……. Dept., …….. University

Prof. Dr. ……. _____
……. Dept., …….. University

Assoc. Prof. Dr. ,,,,,,,,,,,,,,,,,, _____
……. Dept., …….. University

Assoc. Prof. Dr. ……. _____
……. Dept., …….. University

Assist. Prof. Dr. …….. _____
……. Dept., …….. University

Date: 28.06.2014

I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

Name, Last name: ……..

Signature:

ABSTRACT

THESIS TITLE IN ENGLISH
(Characteristics are as given: Times New Roman, 14, UPPERCASE letters, centered text and single spaced)

Surname, Name

Ph.D., Department of Computer Engineering

Supervisor: Prof. Dr. …….

Co-Supervisor: Prof. Dr. (if available)……

Text should be: Times New Roman, 12 pts, and the abstract should be max 300 words...ex: Nanotechnology is a field with a wide variety of applications among which Computer Engineering takes place.....

Keywords: (use 4-5 keywords) ex. Nanotechnology; Computer Engineering; …….

ABSTRAKT

TITULLI I TEZES NE GJUHEN SHQIPE (Teksti duhet të jetë në këtë mënyre: Times New Roman, 14, UPPERCASE letters dhe single space)

Mbiemri, Emri

Doktoraturë, Departamenti i Inxhinierise Kompjuterike

Udhëheqësi: Prof. Dr. .....

Udheheqesi i perbashket: Prof. Dr. (nëse ka)……..

Teksti duhet të jetë: Times New Roman, 12 pts, Justified dhe abstrakti duhet të ketë maksimumi 300 fjalë…..psh..Nanoteknologjia është një fushë me një gamë të gjerë aplikimesh. Një ndër këto është Inxhinieria Kompjuterike…..

Fjalët kyçe: (përdor max 4-5 fjale kyçe) psh. Nanoteknologji; Inxhinieri Kompjuterike, ...

Dedicated to……..…

ACKNOWLEDGEMENTS (optional)

I would like to express my special thanks to my supervisor Prof. Dr. …….. for his continuous guidance, encouragement, motivation and support during all the stages of my thesis. I sincerely appreciate the time and effort he has spent to improve my experience during my graduate years.

I am also deeply thankful to……..

My sincere acknowledgements go to my thesis progress committee members, ……., for their comments and suggestions throughout the entire thesis.

I deeply thank to …….

I am especially grateful to ……

I would like to thank to …….

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

FIGURES (cite the refences as given below if the pictures are not your own product, there is no limitation in the number of figures you can use)

LIST OF ABBREVIATIONS

Coll	Collagen
CF	Carbon fibers
CLSM	Confocal Laser Scanning Microscope
ECM	Extracellular Matrix
G	Shear Modulus
NaCl	Sodium Chloride
SEM	Scanning Electron Microscope
ε^*_{el}	Elastic Collapse Strain
σ^*_{el}	Elastic Collapse Stress

CHAPTER 1

INTRODUCTION

Normal text should be Times New Roman, 12 pts, and justified. Spacing should be 1.5 and there should be a space between paragraphs (if you do not use indentation). References ahould be cited as given in the example below and the figure and tables should be cited in the text whenever mentioned about the figure. Introduction is at the same time Literature review about the topic. You may call it introduction or Literature Review.

ex…..Meniscal tears are the most common injuries nowadays and can occur either as a result of various sport activities or normal tissue degeneration as the age increases. According to some statistical data taken from British Orthopaedic Sports Trauma Association (B.O.S.T.A), 61 of 100000 people suffer from meniscus problems. Furthermore, more than 400000 surgeries are performed per year in Europe [van der Bracht *et. al.,* 2007].

1.1. Meniscus Structure and Function

There exists two types of meniscal tissue, namely the medial and the lateral meniscus, the former being more semilunar and the latter more semicircular in shape (*Fig. 1*). They are attached to each other by the transverse ligament. Some other ligaments such as anterior and posterior cruciate ligaments and medial and lateral collateral ligaments are

present; all of which help in restricting bone movement and maintaining functionality of the knee joint [Athanasiou *et. al.*, 2009].

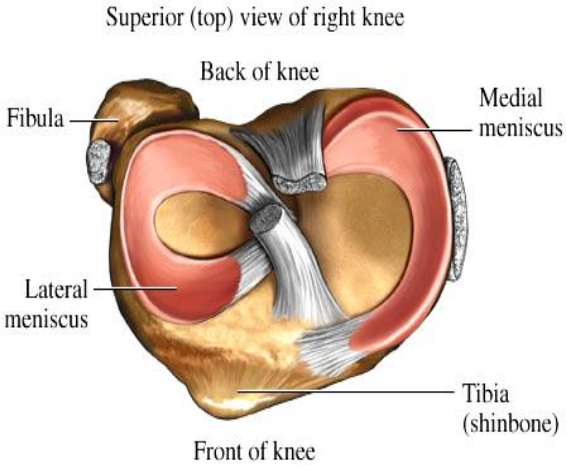

Figure 1. Superior view of…… [Sanchez-Adams *et. al.*, 2009].

1.1.1. Meniscus Development

1.1.2. Cell Types

While many researchers in general call the meniscus cells fibrochondrocytes, some others prefer to divide them in 4 groups based on their shape; location and function [McDevitt *et. al.* (2002)].

1.1.2.1. Influence of Collagen Orientation on Meniscus Biomechanics

Most of the studies performed on meniscus are tensile [Proctor *et. al.*, 1989; Fithian *et. al.*, 1990; Skaggs *et. al.*, 1994; Tissakht *et. al.*, 1995; Goertzen *et. al.*, 1996, 1997;

Lechner *et. al.,* 2000; Holloway *et. al.,* 2010; Nerurkar *et. al.,* 2010], with a few ones being compressive [Proctor *et. al.,* 1989; Hacker *et. al.,* 1992; Leslie *et. al.,* 2000; Sweigart *et. al.,*2004; Holloway *et. al.,* 2010; Nerurkar *et. al.,* 2010] and shear studies [Fithian *et. al.,* 1990; Anderson *et. al.,* 1991; Zhu *et. al.,* 1994].

1.2. Meniscal Injuries and Repair Techniques

1.2.1. Meniscal Injuries

1.2.2. Meniscal Repair Techniques

……..

1.2.2.1. Meniscectomy

1.2.2.2. Meniscal Repair

1.3. Tissue Engineering of the Knee Meniscus

1.4. Aim and Novelty of the Study

The goal of this study was ……

CHAPTER 2

MATERIALS AND METHODS

2.1. Materials

In this section you have to write all the materials you have used to complete the study. After you give the name of the material you should include (in brackets) the name of the company and the country it was obtained from…

Ex…Collagen type I from bovine Achilles' tendon (BAT I), chondroitin sulfate A (CS) sodium salt from bovine trachea, hyaluronic acid (HA) potassium salt from human umbilical cord and amphotericin B were obtained from Sigma-Aldrich (USA and Germany).

2.2. Methods

In this section you should include all the methods and procedures you use to do your thesis.

2.2.1. Collagen Type I Isolation from Rat Tail

2.2.2. Collagen Characterization

2.2.3. Scaffold Preparation

……..

2.2.3.1. Collagen Foam Preparation

For each equipment you mention in the text you have to write in brackets the Model type, Company name and the Country.

ex: The slurry was homogenized (Sartorius Homogenizer, BBI-8542104, Potter S, Germany) …….

2.2.3.2. Collagen-Chondroitin Sulfate-Hyaluronic Acid (Coll-CS-HA) Foam Production

2.2.3.3. Cell Characterization

2.2.3.3.1. RT-PCR for Detection of Collagen Type I and Type II

2.2.4. Statistical Analysis

Ex: The statistical analysis of the data was carried out using Student's *t-test.* All the results were expressed as mean ± standard deviation.

CHAPTER 3

RESULTS AND DISCUSSION

3.1. Collagen Characterization by SDS-PAGE

……

3.2. Scaffold Preparation

3.2.1. Collagen Foam Preparation and Physical and Microscopical Characterization

Ex. ….As it was expected, the higher the solution concentration used to prepare the foams, the higher were the foam mechanical properties (*Table 1*); the highest compressive modulus was obtained with 2 %, w/v solution (781.6 ± 94.6 kPa). A 3-fold increase in the mechanical properties of foams was observed with double crosslinking, with DHT and GP. A similar observation was reported by Tierney *et. al.*, (2009) who stated that doubling concentration of collagen from 0.5 % to 1 % and increasing the DHT crosslinking temperature and duration from 105ºC (24 h) to 150 ºC (48 h) resulted in 3-4 fold increase in the compressive modulus of their foams [Tierney *et. al.*, 2009].

Table 1. Compression test results of BATC I-based foams crosslinked with different methods.

Foam Concentration[#] (%, w/v)	**Crosslinker Type**	**E[*] (kPa)**
1.0	GP	41.9 ± 8.9
	DHT + GP	223.3 ± 37.4
1.5	GP	123.7 ± 21.7
	DHT + GP	392.6 ± 82.7
2.0	GP	196.7 ± 39.5
	DHT + GP	781.6 ± 94.6

GP: Genipin; DHT: dehydrothermal treatment; [#]: All foams were prepared by freezing at -20ºC.

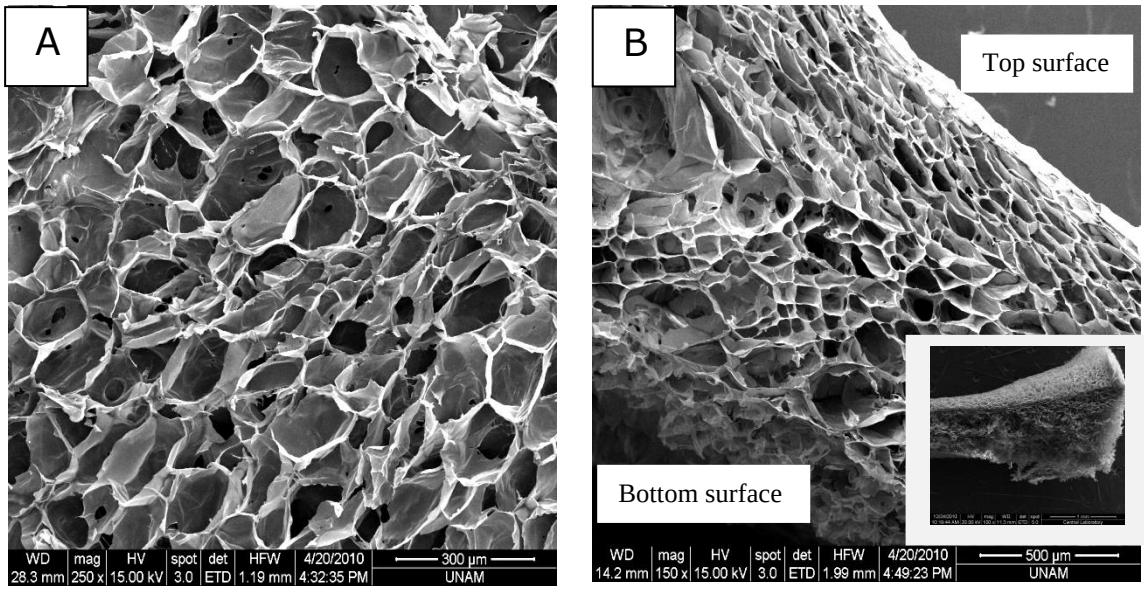

Figure 2. Scanning electron micrographs (SEM) of a collagen foam (2 %, w/v). (A) Middle surface (magnification: x250) and (B) cross section in vertical direction (magnification: x150).

Figure 14 shows that the size of pores of a typical 2% (w/v) foam was between 50-200 µm (*Fig. 14A*) and the foam crosssection was highly porous throughout (*Fig. 14B*) even though the pores were slighlty longitudinally oriented and had a good pore interconnectivity.

3.2.2. Uniaxial Tensile Test

Most of the studies that were carried out give information about the tensile mechanical properties of the scaffolds.

CHAPTER 4

CONCLUSION

.....

REFERENCES

How to cite Journals:

Anderson DR., Woo SL., Kwan MK., Gershuni DH., 'Viscoelastic shear properties of the equine medial meniscus. J. Orthop. Res., 9: 550–558 (1991).

Barnes CP., Pemble CW., Brand DD., Simpson DG., Bowlin GL., 'Cross-linking electrospun type II collagen tissue engineering scaffolds with carbodiimide in ethanol', Tissue Eng., 13 (7): 1593-1605 (2007).

Chamberlein LJ., Yannas IV., Hsu HP., Stritchartz G., Spector M., 'Collagen-GAG substrate enhances the quality of nerve regeneration through collagen tubes up to level of autograft', Exp. Neurol., 154: 315-329 (1998).

Gabrion A., Aimedieu P., Laya Z., Havet E., Mertl P., Grebe R., Laude M., 'Relationship between ultrastructure and biomechanical properties of the knee meniscus', Surg Radiol Anat, 27(6): 507-10 (2005).

How to cite Web sites:

http://biokineticist.com/knee%20-%20meniscus.htm (lastly visited on 21 July 2011).

How to cite Books:

Leenslag JW., Pennings AJ., Veth RPH., Nielsen HKL., Jansen HWB., 'A porous composite for reconstruction of meniscus lesions. In: Christel P., Meunier A., Lee AJC., ed. Biological and Biomechanical Performance of Biomaterials. Amsterdam: Elsevier Science Publishers, p. 147 (1986).

APPENDIX A

Ex. CALIBRATION CURVE FOR DETERMINATION OF CELL NUMBER

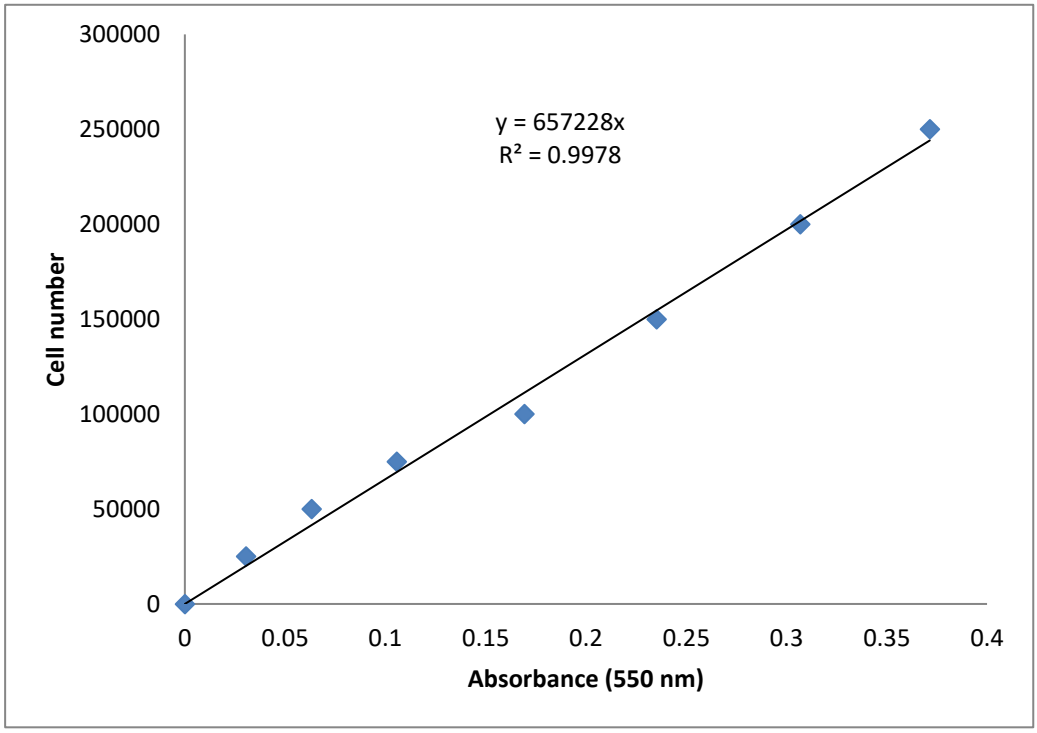

Figure 3. Calibration curve of human meniscus cells (NY: P3)

APPENDIX B (if available)

CURRICULUM VITAE

PERSONAL INFORMATION

Surname, Name:

Nationality:

Date and Place of Birth:

Marital Status:

Phone:

Fax:

E-mail:

EDUCATION

ACADEMIC EXPERIENCE (if available)

AWARDS (if available)

FOREIGN LANGUAGES

PUBLICATIONS (Journals)

ORAL PRESENTATIONS (Conferences)

PATENTS (if available)