MEDICAL PHYSICS AND BIOMEDICAL ENGINEERING
WORLD CONGRESS 2009
For the benefit of the Patient.
Sept 7 – 12, Munich
11th International Congress of the IUPESM

EVICAB
An Open Source Portal for Internet Education

Jaakko Malmivuo, Asta Kybartaite and Juha Nousiainen
Tampere University of Technology, Tampere, Finland

EVICAB

http://www.evicab.eu

Idea of EVICAB

EVICAB

http://www.evicab.eu

EVICAB is a:
- high quality
- free access
BME Curriculum on the Internet

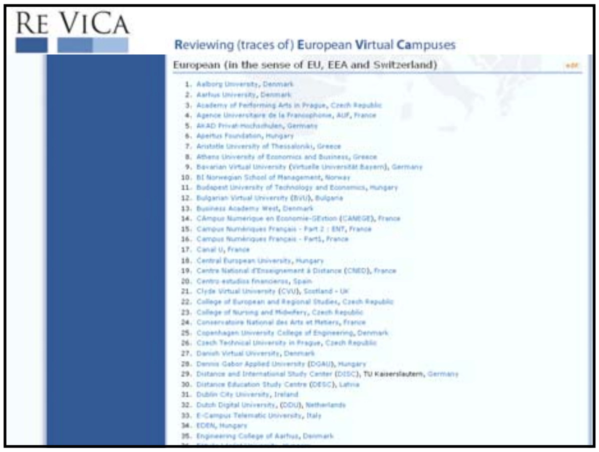
EVICAB is not a university.
EVICAB material may be used by universities.

RE VICA
Reviewing (traces of) European Virtual Campuses

http://revica.europace.org

We are not alone!

Re Vi Ca lists e-learning providers
- more than 170 in Europe
- more than 300 in the rest of the world
- **altogether about 500**
- **in 156 countries**


RE VICA
Reviewing (traces of) European Virtual Campuses

European (in the sense of EU, EEA and Switzerland)

1. Aalborg University, Denmark
2. Aarhus University, Denmark
3. Academy of Performing Arts in Prague, Czech Republic
4. Agence Universitaire de la Francophonie, AUF, France
5. AKAD Privat-Hochschulen, Germany
6. Apertus Foundation, Hungary
7. Aristotle University of Thessaloniki, Greece
8. Athens University of Economics and Business, Greece
9. Bavarian Virtual University (Virtuelle Universität Bayern), Germany
10. BI Norwegian School of Management, Norway
11. Budapest University of Technology and Economics, Hungary
12. Bulgarian Virtual University (BVU), Bulgaria
13. Business Academy West, Denmark
14. CAmpus Numerique en Economie-GEstion (CANEGE), France
15. Campus Numériques Français - Part 2 : ENT, France
16. Campus Numériques Français - Part1, France
17. Canal U, France
18. Central European University, Hungary
19. Centre National d'Enseignement à Distance (CNED), France
20. Centro estudios financieros, Spain
21. Clyde Virtual University (CVU), Scotland - UK
22. College of European and Regional Studies, Czech Republic
23. College of Nursing and Midwifery, Czech Republic
24. Conservatoire National des Arts et Metiers, France
25. Copenhagen University College of Engineering, Denmark
26. Czech Technical University in Prague, Czech Republic
27. Danish Virtual University, Denmark
28. Dennis Gabor Applied University (DGAU), Hungary
29. Distance and International Study Center (DISC), TU Kaiserslautern, Germany
30. Distance Education Study Centre (DESC), Latvia
31. Dublin City University, Ireland
32. Dutch Digital University, (DDU), Netherlands
33. E-Campus Telematic University, Italy
34. EDEN, Hungary
35. Engineering College of Aarhus, Denmark

To characterize EVICAB,
I give examples of two different Internet Education Portals

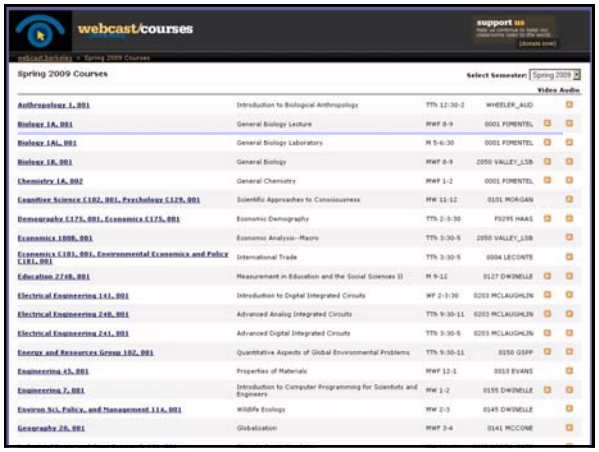
- University of Berkeley
- Yovisto

Berkeley
UNIVERSITY OF CALIFORNIA

http://webcast.berkeley.edu/courses.php

University of Berkeley Webcast

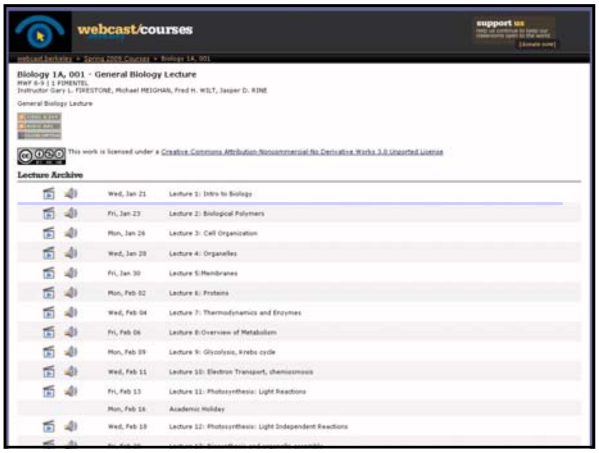
- Large number of courses
- Arhicve (Webcast) and
  Real Time (Podcast)
- Web Camera shows the teacher
  in the classroom at the blackboard
- No supporting educational material
- Videos provided by the university
- Free access


webcast/courses
support us
webcast.berkeley > Spring 2009 Courses

Spring 2009 Courses

Select Semester: Spring 2009

				Video	Audio
Anthropology 1, 001	Introduction to Biological Anthropology	TTh 12:30-2	WHEELER_AUD		■
Biology 1A, 001	General Biology Lecture	MWF 8-9	0001 PIMENTEL	■	■
Biology 1AL, 001	General Biology Laboratory	M 5-6:30	0001 PIMENTEL	■	■
Biology 1B, 001	General Biology	MWF 8-9	2050 VALLEY_LSB	■	■
Chemistry 1A, 002	General Chemistry	MWF 1-2	0001 PIMENTEL	■	■
Cognitive Science C102, 001, Psychology C129, 001	Scientific Approaches to Consciousness	MW 11-12	0101 MORGAN		■
Demography C175, 001, Economics C175, 001	Economic Demography	TTh 2-3:30	F0295 HAAS	■	■
Economics 100B, 001	Economic Analysis--Macro	TTh 3:30-5	2050 VALLEY_LSB		■
Economics C181, 001, Environmental Economics and Policy C181, 001	International Trade	TTh 3:30-5	0004 LECONTE		■
Education 274B, 001	Measurement in Education and the Social Sciences II	M 9-12	0127 DWINELLE	■	■
Electrical Engineering 141, 001	Introduction to Digital Integrated Circuits	WF 2-3:30	0203 MCLAUGHLIN	■	■
Electrical Engineering 240, 001	Advanced Analog Integrated Circuits	TTh 9:30-11	0203 MCLAUGHLIN	■	■
Electrical Engineering 241, 001	Advanced Digital Integrated Circuits	TTh 3:30-5	0203 MCLAUGHLIN	■	■
Energy and Resources Group 102, 001	Quantitative Aspects of Global Environmental Problems	TTh 9:30-11	0150 GSPP	■	■
Engineering 45, 001	Properties of Materials	MWF 12-1	0010 EVANS		■
Engineering 7, 001	Introduction to Computer Programming for Scientists and Engineers	MW 1-2	0155 DWINELLE	■	■
Environ Sci, Policy, and Management 114, 001	Wildlife Ecology	MW 2-3	0145 DWINELLE		■
Geography 20, 001	Globalization	MWF 3-4	0141 MCCONE		■


webcast/courses
support us
webcast.berkeley > Spring 2009 Courses > Biology 1A, 001

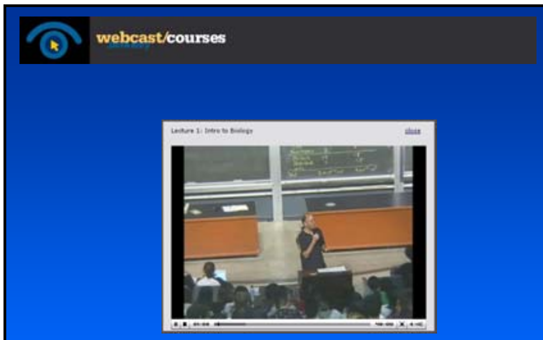
Biology 1A, 001 - General Biology Lecture
MWF 8-9 | 1 PIMENTEL
Instructor Gary L. FIRESTONE, Michael MEIGHAN, Fred H. WILT, Jasper D. RINE

General Biology Lecture

This work is licensed under a Creative Commons Attribution-Noncommercial-No Derivative Works 3.0 Unported License

Lecture Archive

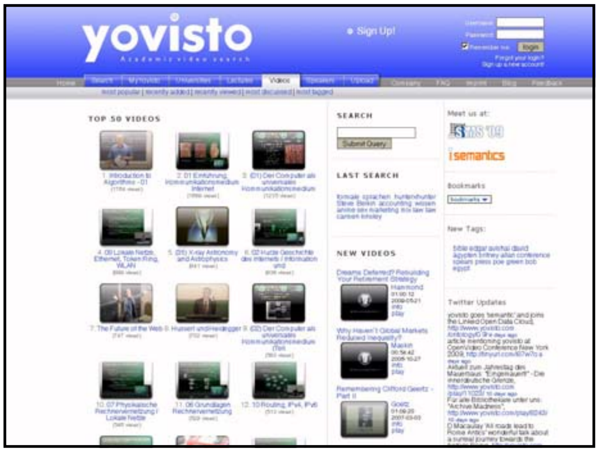
Wed, Jan 21	Lecture 1: Intro to Biology
Fri, Jan 23	Lecture 2: Biological Polymers
Mon, Jan 26	Lecture 3: Cell Organization
Wed, Jan 28	Lecture 4: Organelles
Fri, Jan 30	Lecture 5:Membranes
Mon, Feb 02	Lecture 6: Proteins
Wed, Feb 04	Lecture 7: Thermodynamics and Enzymes
Fri, Feb 06	Lecture 8:Overview of Metabolism
Mon, Feb 09	Lecture 9: Glycolysis, Krebs cycle
Wed, Feb 11	Lecture 10: Electron Transport, chemiosmosis
Fri, Feb 13	Lecture 11: Photosynthesis: Light Reactions
Mon, Feb 16	Academic Holiday
Wed, Feb 18	Lecture 12: Photosynthesis: Light Independent Reactions

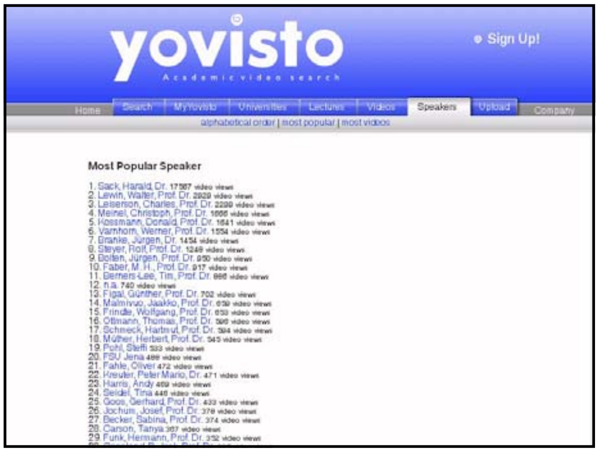

webcast/courses
Lecture 1: Intro to Biology
close

yovisto
Academic video search

http://www.yovisto.com

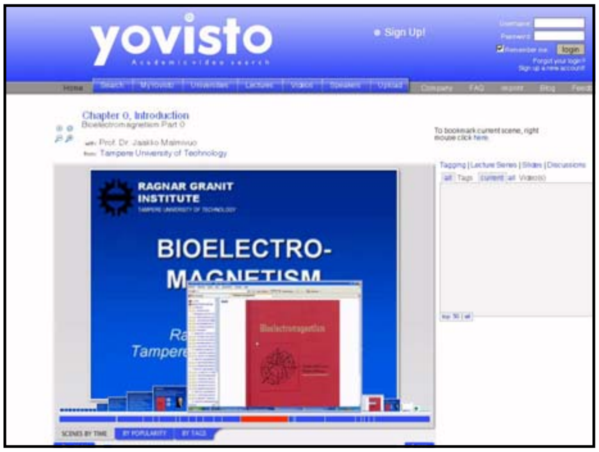
- Large number of speakers (> 1 000)
- Large number of videos (> 12 000)
- Arhicve (Webcast)
- Only video or slides
- No supporting educational material
- Free upload of videos
- High technology Portal
- Powerful search functions
- Free access


yovisto
Academic video search
Sign Up!
login
Videos
TOP 50 VIDEOS
1. Introduction to Algorithms - 01
7. The Future of the Web
8. Husserl und Heidegger
12. 10 Routing, IPv4, IPv6
SEARCH
Submit Query
LAST SEARCH
NEW VIDEOS
Meet us at:
isemantics
Bookmarks
New Tags:
Twitter Updates


yovisto
Academic video search
Sign Up!
Home
Search
MyYovisto
Universities
Lectures
Videos
Speakers
Upload
Company
alphabetical order | most popular | most videos

Most Popular Speaker

1. Sack, Harald, Dr. 17567 video views
2. Lewin, Walter, Prof. Dr. 2929 video views
3. Leiserson, Charles, Prof. Dr. 2299 video views
4. Meinel, Christoph, Prof. Dr. 1666 video views
5. Kossmann, Donald, Prof. Dr. 1641 video views
6. Varnhorn, Werner, Prof. Dr. 1554 video views
7. Branke, Jürgen, Dr. 1454 video views
8. Steyer, Rolf, Prof. Dr. 1249 video views
9. Bolten, Jürgen, Prof. Dr. 950 video views
10. Faber, M. H., Prof. Dr. 917 video views
11. Berners-Lee, Tim, Prof. Dr. 866 video views
12. n.a. 740 video views
13. Figal, Günther, Prof. Dr. 702 video views
14. Malmivuo, Jaakko, Prof. Dr. 659 video views
15. Frindle, Wolfgang, Prof. Dr. 653 video views
16. Ottmann, Thomas, Prof. Dr. 596 video views
17. Schmeck, Hartmut, Prof. Dr. 594 video views
18. Mülher, Herbert, Prof. Dr. 545 video views
19. Pohl, Steffi 533 video views
20. FSU Jena 488 video views
21. Fahle, Oliver 472 video views
22. Kreuter, Peter Mario, Dr. 471 video views
23. Harris, Andy 469 video views
24. Seidel, Tina 446 video views
25. Goos, Gerhard, Prof. Dr. 433 video views
26. Jochum, Josef, Prof. Dr. 378 video views
27. Becker, Sabina, Prof. Dr. 374 video views
28. Carson, Tanya 367 video views
29. Funk, Hermann, Prof. Dr. 352 video views


yovisto
Academic video search
Sign Up!
Username
Password
Remember me
login
Forgot your login?
Sign up a new account!
Home
Search
MyYovisto
Universities
Lectures
Videos
Speakers
Upload
Company
FAQ
Imprint
Blog
Feedback
Tagging | Lecture Series | Slides | Discussions
all Tags current all Video(s)
RAGNAR GRANIT INSTITUTE
TAMPERE UNIVERSITY OF TECHNOLOGY
BIOELECTRO-
MAGNETISM
Bioelectromagnetism
SCENES BY TIME
BY POPULARITY
BY TAGS

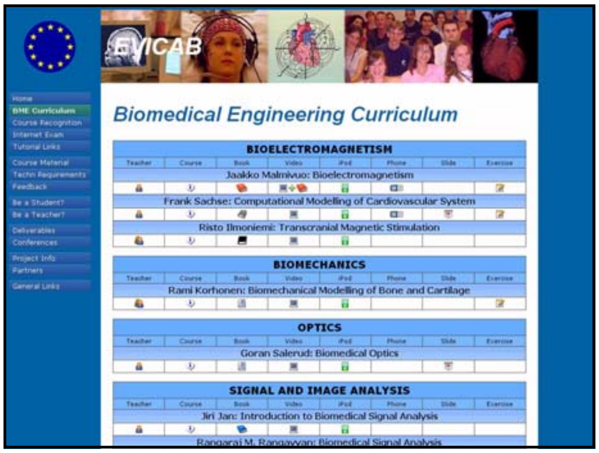
Chapter 0, Introduction
Bioelectromagnetism Part 0
with: Prof. Dr. Jaakko Malmivuo
from: Tampere University of Technology

To bookmark current scene, right mouse click here.

EVICAB

http://www.evicab.eu

- Several courses (Curriculum)
- Only university recognized courses
- Videos uploaded by the operator
- Archive (Webcast)
- Open source technology portal
- PowerPoint slides ***and*** teacher video
- Viewed by PC, iPod, Media Phone etc.
- Rating and commenting
- All supporting educational material
- Internet Examination


EVICAB
Home
BME Curriculum
Course Recognition
Internet Exam
Tutorial Links
Course Material
Techn Requirements
Feedback
Be a Student?
Be a Teacher?
Deliverables
Conferences
Project Info
Partners
General Links

Biomedical Engineering Curriculum

BIOELECTROMAGNETISM

Teacher	Course	Book	Video	iPod	Phone	Slide	Exercise
Jaakko Malmivuo: Bioelectromagnetism							
Frank Sachse: Computational Modelling of Cardiovascular System							
Risto Ilmoniemi: Transcranial Magnetic Stimulation							

BIOMECHANICS

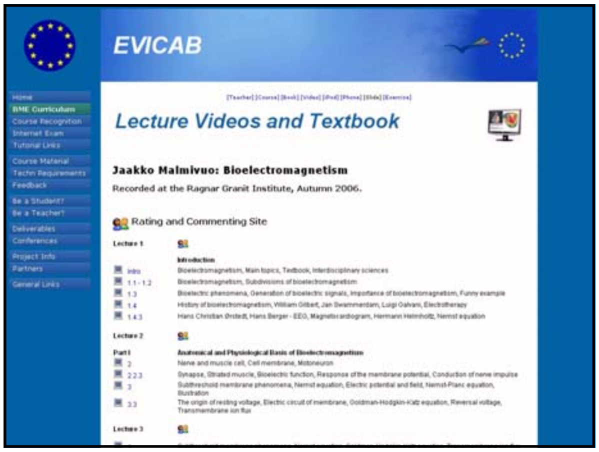
Teacher	Course	Book	Video	iPod	Phone	Slide	Exercise
Rami Korhonen: Biomechanical Modelling of Bone and Cartilage							

OPTICS

Teacher	Course	Book	Video	iPod	Phone	Slide	Exercise
Goran Salerud: Biomedical Optics							

SIGNAL AND IMAGE ANALYSIS

Teacher	Course	Book	Video	iPod	Phone	Slide	Exercise
Jiri Jan: Introduction to Biomedical Signal Analysis							
Rangaraj M. Rangayyan: Biomedical Signal Analysis							


EVICAB
Home
BME Curriculum
Course Recognition
Internet Exam
Tutorial Links
Course Material
Techn Requirements
Feedback
Be a Student?
Be a Teacher?
Deliverables
Conferences
Project Info
Partners
General Links
[Teacher] [Course] [Book] [Video] [iPod] [Phone] [Slide] [Exercise]

Lecture Videos and Textbook

Jaakko Malmivuo: Bioelectromagnetism

Recorded at the Ragnar Granit Institute, Autumn 2006.

Rating and Commenting Site

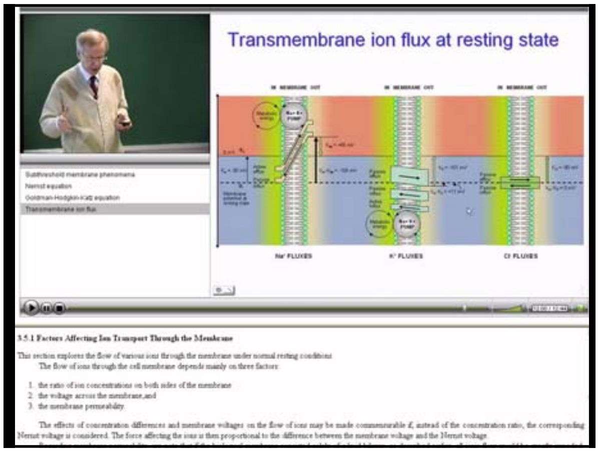
Lecture 1

	Introduction
Intro	Bioelectromagnetism, Main topics, Textbook, Interdisciplinary sciences
1.1 - 1.2	Bioelectromagnetism, Subdivisions of bioelectromagnetism
1.3	Bioelectric phenomena, Generation of bioelectric signals, Importance of bioelectromagnetism, Funny example
1.4	History of bioelectromagnetism, William Gilbert, Jan Swammerdam, Luigi Galvani, Electrotherapy
1.4.3	Hans Christian Ørsted, Hans Berger - EEG, Magnetocardiogram, Hermann Helmholtz, Nernst equation

Lecture 2

Part I	**Anatomical and Physiological Basis of Bioelectromagnetism**
2	Nerve and muscle cell, Cell membrane, Motoneuron
2.2.3	Synapse, Striated muscle, Bioelectric function, Response of the membrane potential, Conduction of nerve impulse
3	Subthreshold membrane phenomena, Nernst equation, Electric potential and field, Nernst-Planc equation, Illustration
3.3	The origin of resting voltage, Electric circuit of membrane, Goldman-Hodgkin-Katz equation, Reversal voltage, Transmembrane ion flux

Lecture 3


Transmembrane ion flux at resting state
Subthreshold membrane phenomena
Nernst equation
Goldman-Hodgkin-Katz equation
Transmembrane ion flux
Na+ FLUXES
K+ FLUXES
Cl- FLUXES

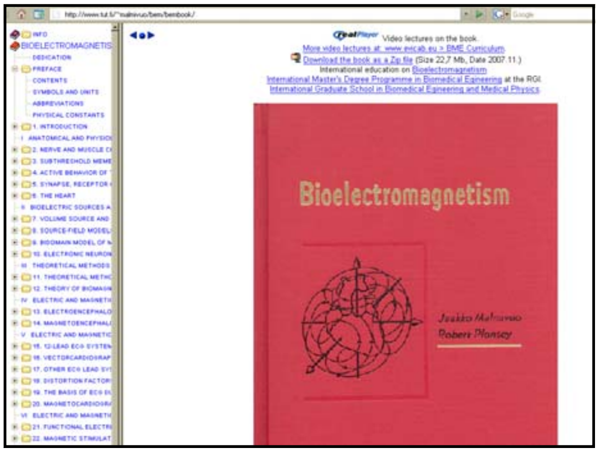
3.5.1 Factors Affecting Ion Transport Through the Membrane

This section explores the flow of various ions through the membrane under normal resting conditions.

The flow of ions through the cell membrane depends mainly on three factors:

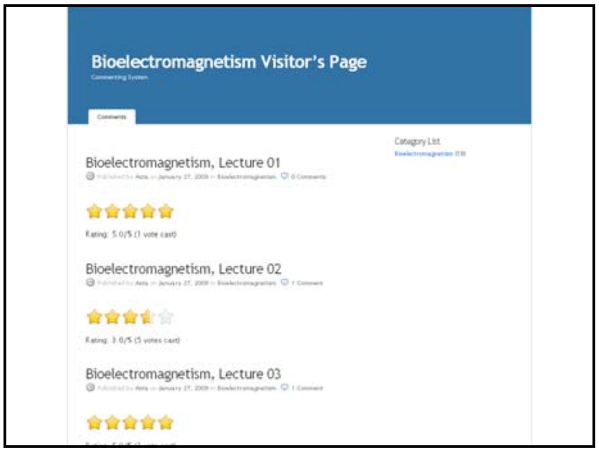
1. the ratio of ion concentrations on both sides of the membrane
2. the voltage across the membrane, and
3. the membrane permeability.

The effects of concentration differences and membrane voltages on the flow of ions may be made commensurable if, instead of the concentration ratio, the corresponding Nernst voltage is considered. The force affecting the ions is then proportional to the difference between the membrane voltage and the Nernst voltage.



http://www.tut.fi/~malmivuo/bem/bembook/
INFO
BIOELECTROMAGNETIS
DEDICATION
PREFACE
CONTENTS
SYMBOLS AND UNITS
ABBREVIATIONS
PHYSICAL CONSTANTS
1. INTRODUCTION
I ANATOMICAL AND PHYSIO
2. NERVE AND MUSCLE C
3. SUBTHRESHOLD MEMB
4. ACTIVE BEHAVIOR OF
5. SYNAPSE, RECEPTOR
6. THE HEART
II BIOELECTRIC SOURCES A
7. VOLUME SOURCE AND
8. SOURCE-FIELD MODEL
9. BIDOMAIN MODEL OF
10. ELECTRONIC NEURON
III THEORETICAL METHODS
11. THEORETICAL METH
12. THEORY OF BIOMAGN
IV ELECTRIC AND MAGNETI
13. ELECTROENCEPHALO
14. MAGNETOENCEPHAL
V ELECTRIC AND MAGNETIC
15. 12-LEAD ECG SYSTEM
16. VECTORCARDIOGRAP
17. OTHER ECG LEAD SY
18. DISTORTION FACTOR
19. THE BASIS OF ECG D
20. MAGNETOCARDIOGR
VI ELECTRIC AND MAGNETI
21. FUNCTIONAL ELECTR
22. MAGNETIC STIMULAT
RealPlayer
Bioelectromagnetism
Jaakko Malmivuo
Robert Plonsey

Video lectures on the book.
More video lectures at: www.evicab.eu > BME Curriculum
Download the book as a Zip file (Size 22,7 Mb, Date 2007.11.)
International education on Bioelectromagnetism
International Master's Degree Programme in Biomedical Egineering at the RGI
International Graduate School in Biomedical Egineering and Medical Physics



Bioelectromagnetism Visitor's Page
Commenting System

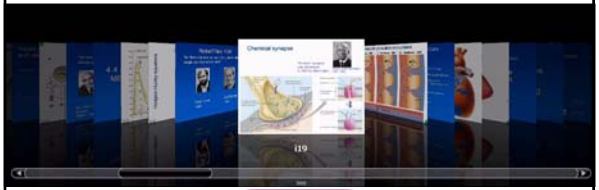
Category List
Bioelectromagnetism (3)

Bioelectromagnetism, Lecture 01
Published by Asta on January 27, 2009 in Bioelectromagnetism 0 Comments
★★★★★
Rating: 5.0/5 (1 vote cast)

Bioelectromagnetism, Lecture 02
Published by Asta on January 27, 2009 in Bioelectromagnetism 1 Comment
Rating: 3.6/5 (5 votes cast)

Bioelectromagnetism, Lecture 03
Published by Asta on January 27, 2009 in Bioelectromagnetism 1 Comment
★★★★★

Video Files for iPod



iPod Nano: 4 or 8 Gb
m4w format
87x45 min = 1 Gb

Carl Zeiss Cinemizer

Video Files for Media Phones

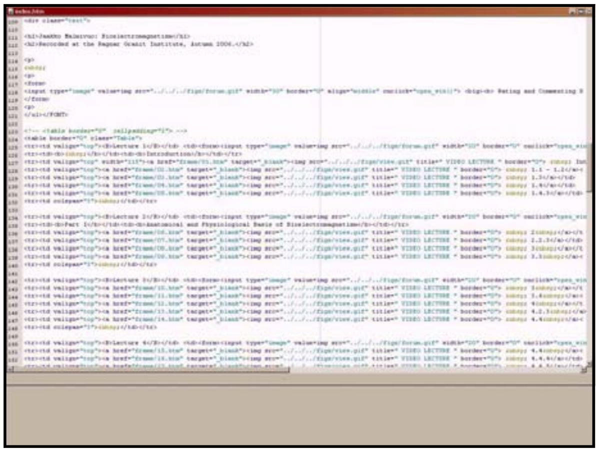
Media Phone
3gp format
87x45 min = 0.5 Gb

EVICAB

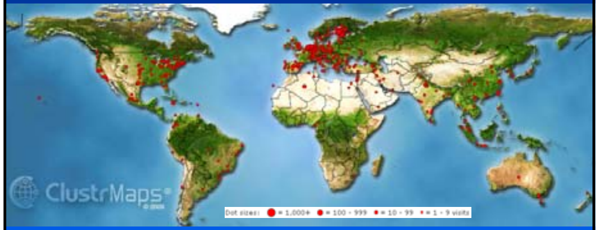
The EVICAB Portal is
Open Source and
may be copied for any application.

Production of Video Files
is described elsewhere

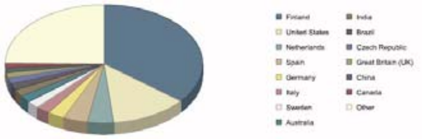
Asta Kybartaite:
Technology behind Video Lectures for Biomedical Engineering



EVICAB Visitors


ClustrMaps
Dot sizes: ● = 1,000+ ● = 100 - 999 ● = 10 - 99 ● = 1 - 9 visits

From over
80 countries



EVICAB

The EVICAB project concentrates on
creating the Virtual Campus
on Biomedical Engineering

The EVICAB Portal may be
applied to **all** disciplines.
Because it is Open Source,
anyone may copy it free of charge.

EVICAB

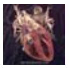
May be Applied to All Disciplines

Anatomy

Law

Biology

Politics



Cardiology

Psychology

Neurology

Social Sci

EVICAB

Build-up of the BME Curriculum

- EVICAB creates a platform for a BME curriculum on the Internet
- Universities may propose a course to EVICAB
- The Steering Group decides what courses are accepted to EVICAB
- EVICAB will get the courses free of charge
- The courses are updated and maintained by those universities which produced them

EVICAB

Why to give a free course to EVICAB?

- EVICAB will become the internationally recognized standard in Internet education
- If a course is accepted to EVICAB, that demonstrates the high quality of the education in that university
- It will attract international students and increase the reputation of that university/institute
- The international assessment and ranking of universities has come more popular and universities compete for their position on the lists
- EVICAB will offer in BME a platform to demonstrate the excellence

Thank you!