UNIVERSIDAD AUTÓNOMA DE BAJA CALIFORNIA

COORDINACIÓN DE FORMACIÓN BÁSICA
COORDINACIÓN DE FORMACIÓN PROFESIONAL Y VINCULACIÓN UNIVERSITARIA

PROGRAMA DE UNIDAD DE APRENDIZAJE POR COMPETENCIAS

I. DATOS DE IDENTIFICACIÓN					
1. Unidad Académica: **Facultad de Arquitectura y Diseño**					
2. Programa de estudio: **Licenciatura en Arquitectura**					3. Vigencia del plan: **2008-1**
4. Unidad de aprendizaje: An introduction to Building Biology (*Baubiologie*).					5. Clave: **20355**
6. HC: **3**	HL:	HT:	HPC:	HE: **3**	CR: **6**
7. Ciclo escolar: **2015-2**			8. Etapa de formación a la que pertenece: **Disciplinaria**		
9. Carácter de la unidad de aprendizaje: **Optativa**					
10. Requisitos para cursar la unidad de aprendizaje: **Ninguna**					

Elaboró:	**M.Arch Jason Pei Lin Yu**	Vo.Bo.:	**Mario Macalpin Coronado**
Fecha:	**Mayo 2015**	Puesto:	**Subdirector**

II. PROPÓSITO GENERAL DEL CURSO.

Course is part of the disciplinary stage and seeks the students to become familiar and integrate the knowledge and practice of Building Biology in architectural projects giving emphasis in aspects of design and evaluation of the relationship between the architectural object and principles of Building Biology.

Este curso optativo de la etapa disciplinaria busca familiarizar al estudiante e integrarlo al conocimiento y la práctica de la Bioedificación (Baubiologie) dando énfasis al diseño y evaluación de la relación entre sus principios y el objeto arquitectónico.

III. COMPETENCIA DEL CURSO.

The course gives the students a review of theoretical principles and trends of Building Biology (Baubilogie); the search of data base and analogies, which enables them to work both collaboratively and independently in a project with principles and search results. Encouraging the students to present the end results through speech and visual presentation in public.

Manejar los principios teóricos y tendencias de la Bioedificación (Baubiologie), investigando las fuentes de información y casos análogos que permitan el trabajo tanto individual como en equipo en el desarrollo de proyectos arquitectónicos y presentando en público los resultados finales a través de medios orales y visuales.

IV. EVIDENCIAS DE DESEMPEÑO.

Essays elaboration in english showing the search results and Building Biology principles. Presentation and Discussion after group of fundings. Selection and refinement of a given Project.

Elaboración de ensayos en inglés mostrando los resultados de la investigación y los principios de la Bioedificación. Presentación y discusión ante grupo sobre el Financiamiento. Selección y mejora de un determinado proyecto.

V. DESARROLLO POR UNIDADES.

UNIDAD I: **Duración:** 6 horas

The Theory of Building Biology (Baubiologie) and SBS (Sick Building Syndrome).

Competencia:

The development of a theoretical platform with Building Biology principles after discussion in class and a search for analogies and available databases.

Contenido.

Lecture: The Theory of Building Biology (Baubiologie).
Case Study and Paper Writing.
What is the meaning of Building Biology:

i. The building as a living entity.
ii. The identification of a building sickness symptom.

UNIDAD II: **Duracion:** 9 horas.

SBS (Sick Building Syndrome) and the 25 Principles of Building Biology (Baubiologie).

Competencia:

To develop the understanding of "*Baubiologie"* as the science of the holistic relationship between life, the living environment and the built

environment. Nature is the ultimate guide and its principles.

Contenido:

The understanding of staying time in a building that embrace our body and soul and awakened senses and principles of Baubiologie. That provides a guideline for a holistic study of the man-made environment, human health and ecology:

1. A building site shall be geologically undisturbed.
2. Residential homes are best located away from industrial centers and main traffic routes.
3. Housing shall be developed in a decentralized and loose manner interlaced with sufficient green space.
4. Housing and developments shall be personalized, in harmony with nature, fit for human habitation and family oriented.
5. Natural and unadulterated building materials shall be used.
6. Walls, floors and ceilings shall be diffusible and hygroscopic.
7. Indoor air humidity shall be regulated naturally.
8. Air pollutants need to be filtered and neutralized.
9. An appropriate balance of thermal insulation and heat retention is needed.
10. The air and surface temperatures of a given room need to be optimized.
11. A heating system shall feature radiant heat using as much (passive) solar heat as possible.
12. The total moisture content of a new building shall be low and dry out quickly.
13. A building shall have a pleasant or neutral smell. No toxins shall outgas.
14. Light, lighting and color shall be in accord with natural conditions.
15. Protective measures against noise pollution as well as infrasonic and ultrasonic vibrations need to be human oriented.
16. Only building materials with little or preferably no radioactivity shall be used.
17. The natural balance of atmospheric electricity and ion concentration shall be maintained.
18. The Earth's natural magnetic field shall not be altered or distorted.
19. Man-made electromagnetic radiation shall be eliminated (or reduced as much as possible).

20. Cosmic and terrestrial radiation is essential and shall be interfered with as little as possible.
21. Interior and furniture design shall be based on physiological findings.
22. Harmonic measures, proportions and shapes need to be taken into consideration.
23. The production, installation and disposal of building materials shall not contribute to environmental pollution and high energy costs.
24. Building activities shall not contribute to the exploitation of non-renewable and rare resources.
25. Building activities shall not cause a rise in social and medical costs.

UNIDAD III: **Duración:** 6 horas.

Building biology evaluation guidelines.

Competencia:

The study of Building Biology trough the set of standards and guidelines. Students are so far individuals who are "environmentally sensitive" to components in their living and work environment. The guidelines follow gives an overview of the physical, chemical and biological risks encountered in sleeping areas, living spaces, workplaces and properties. It offers guidelines on how to perform specific measurements and assess possible health risks. All testing results, testing instruments and procedures are documented in a final written report. In case potential problems are identified, an effective remediation strategy is developed.

Contenido:

The review of individual subcategories of the Standard describing critical indoor environmental influences. With architectural approach, helps identify, minimize and avoid such factors within an individual's framework of achievability:

1 AC ELECTRIC FIELDS (Low Frequency, ELF/VLF) Sources: AC voltage in electrical installations, cables, appliances, outlets, walls, floors, beds, high-tension and other power lines... Measurement of low frequency electric field strength (V/m) and human body

voltage (mV) as well as identification of dominant frequency (Hz) and prominent harmonics.

2 AC MAGNETIC FIELDS (Low Frequency, ELF/VLF) Sources: AC current in electrical installations, cables, appliances, transformers, motors, overhead and ground cables, power lines, railways... Measurement and data logging of low frequency magnetic flux density (nT) from power grid or railway system as well as identification of dominant frequency (Hz) and prominent harmonics.

3 RADIOFREQUENCY RADIATION (High Frequency, Electromagnetic Waves) Sources: cell phone technology, RF transmitters, broadcast, trunked radio systems, line-of-sight systems, radar, military, cordless phones...Measurement of high frequency electromagnetic power density (uW/m2) as well as identification of dominant RF sources and low frequency signals (pulse, periodicity, modulation).

4 DC ELECTRIC FIELDS (Electrostatics) Sources: synthetic carpeting, drapes and textiles, vinyl wallpaper, varnishes, laminates, stuffed toy animals, TV or computer screens...Measurement of electrostatic surface potential (V) as well as discharge time (s)

5 DC MAGNETIC FIELDS (Magneto statics) Sources: steel components in beds, mattresses, furniture, appliances, building materials; DC current in street cars, photovoltaic systems... Measurement of geomagnetic field distortion as spatial deviation of magnetic flux density (uT, metal/ steel) or temporal fluctuation of magnetic flux density (uT, current) as well as compass deviation.

6 RADIOACTIVITY (Gamma Radiation, Radon) Sources: building materials, stones, tiles, slags, waste products, devices, antiques, ventilation, terrestrial radiation, location, environment... Measurement of equivalent dose rate (nSv/h, %) as well as radon concentration (Bq/mP3P).

7 GEOLOGICAL DISTURBANCES (Geomagnetic Field, Terrestrial Radiation) Sources: currents and radioactivity in the earth; local disturbances caused by faults, fractures, underground water courses... Measurement of earth's magnetism (nT) and earth's radiation (ips) and its prominent disturbances (%).

8 SOUND and VIBRATION (Airborne and Solid Sound) Sources: traffic noise, air traffic, train traffic, industry, buildings, devices, machines, motors, transformers and sound bridges.

UNIDAD IV: **Duración:** 12 horas.

Case studies and presentations by groups for 25 principles and evaluation guideline of “Baubiologie”.

Competencia:

To detect the problems and work on case studies applying the knowledge and techniques from 25 principles and evaluation guideline of Building Biology, “Baubiologie” to develop check points and step by step strategies to identify the problems and produce the feasible solutions in architectural, engineering, bio-chemical and public health issues in sleeping areas, living spaces, workplaces and overall environment.

UNIDAD V: **Duración:** 15 horas

Final project presentation

Competencia:

To detect the problems and work on one realistic case applying the knowledge and techniques to develop check points and step by step strategies to identify the problems and produce the feasible solutions. The final proposal will be conducted by collaborative research end team work.

VI. MÉTODO DE TRABAJO.

The experience of different experts in the field are taking in account and geared to prepared future professionals in architecture and design working as a professional consultant on how to create healthy buildings considering the diverse and varied climate zones across the country. Students are also provided with an extensive understanding of Occupational Health and Safety risk management methodologies to enable them to undertake professional work.

The course is organized as follows:

Part a) Introductory thematic exhibition by the teacher and students.

Part b) Documentary and bibliographic research and discussion by students.

Part c) Exercises research and evaluation of projects by students.

VII. EVALUATION CRITERIA

1. (Case studies) papers and presentations: 50%
2. Attendance: 10%
3. Group coordination and involvement: 10%
4. Final Project: 30%

VIII. BIBLIOGRAFÍA

Básica.	Complementaria
Constructivist learning environments: Case studies in instructional design BG Wilson - 1996 - books.google.com ... 3. Classroom environment-Case studies . Harvard philosopher Israel Scheffler (1965), building on Ryle's work, emphasizes how many areas of know-how forbid. Building theories from case study research KM Eisenhardt - Academy of management review, 1989 - .That is, they have already undergone repeated verification during the theory- building process ... Navigating social-ecological systems: building resilience for complexity and change F Berkes, J Colding, C Folke - 2002 - books.google.com Modeling survival and testing biological hypotheses using marked animals: a unified approach with case studies JD Lebreton, KP Burnham, J Clobert ... - Ecological ... , 1992 - Eco SocAmerica Building organisational culture that stimulates creativity and innovation EC Martins, F Terblanche - European journal of innovation ... ,2003 emeraldinsight.com, European Journal of Innovation ... Very few empirical studies, and especially quantitative research, seem to have been done to support the findings of researchers.	Building a new biocultural synthesis: political-economic perspectives on human biology AH Goodman, TL Leatherman - 1998 - books.google.com The social and environmental effects of large dams. Volume 2: case studies. E Goldsmith, N Hildyard - 1986 - cabdirect.org . The case studies are wide-ranging from both developed and developing countries. Parallel computing for bioinformatics and computational biology: models, enabling technologies,and case studies AY Zomaya - 2006 - books.google.com