

IBE 312

2018

Advanced Electromagnetic Radiation



Enrollment is open only to students who have successfully completed IBE 212 Electromagnetics; exceptions can be made for candidates with professional real-world experience by applying to IBE and after considering specifics supplied. Ask for a waiver application.

Participants are required to review the course work for IBE 212 as this basic material will not be reviewed, and it is assumed that participants know this information and are totally familiar with it, and are able to make measurements with the basic instrumentation use in IBE 212.

The daily schedule includes lectures, instrument demonstrations, group labs with recommended instrumentation, inter-active discussions of lab results and, finally, a full assessment of retreat premises.



INTERNATIONAL INSTITUTE FOR
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Please Note Carefully: The hands-on labs conducted 4 out of 5 days consist of realistic situations set up by the instructors where elevated electric, magnetic and radio frequency fields exist. These fields exist in order to practice use of instruments for evaluation of conditions and identification of sources and to practice remediation of the fields. These field levels exceed those found in most normal circumstances. Electric fields may range up to 100 v/m close to sources. Magnetic fields will be of 6 milli-Gauss in large areas of the lab room and closer to sources. Pulsed, digital RF levels will range up to several thousand microwatts per square meter close to sources. While efforts are made to limit the length of time these fields are on, they do exist for some time during each lab. In the final lab all 3 fields types will exist possibly together. Please consider this reality in making your decision to attend this seminar.



Please direct all inquiries to:
outreach@buildingbiology.net • (866) 960-0333
Click [here](#) for more information on Building Biology

Seminar Syllabus: IBE 312

Seminar Synopsis

This IBE 312 advanced seminar amplifies the measurement and remediation techniques information learned in IBE 212. The seminar will include more detailed information on power system magnetic and electric fields, power system VLF fields and radio frequency radiation.

The seminar will more fully explore remediation techniques and materials along with remediation planning, costing and installation. Along with use of basic instrumentation to assess environments for EMR, advanced measurement techniques and instrumentation will be introduced. The IBE Protocol for *Measurement of Non-ionizing EMR in Low Rise Residential Buildings* will be introduced and used through out the seminar to guide measurement technique.

Although there will be lecture to introduce new concepts and instrumentation, this seminar will be heavily devoted to lab work. In a team setting, basic and advanced equipment will be used by attendees to assess realistic environments and models constructed to produce typical problems found in buildings. Team members will discuss findings and produce remediation plans to be shared with the other teams during debriefing sessions.

Participants are required to review the course work for IBE 212 as this basic material will not be reviewed and it assume that participants know this information and are totally familiar and are able to make measurements with the basic instrumentation use in IBE 212.

Participants are also required to purchase and read prior to arrival *Tracing EMFs in Building Wiring and Grounding*, by Karl Riley: Available at Barnes & Noble and Amazon for about \$25.

Enrollment is open only to students who have successfully completed IBE 212, Electromagnetics, in the past two years. An exception can be made for students who attended IBE 212 three or more years ago, as follows: should you meet this exception, please ask to be sent a waiver application, which will be reviewed by the instructors, whose decision to approve or decline your waiver application will be final.

This seminar conveys 40 Continuing Education Credits (CEUs), accepted by AIA, ACAC, and InterNACHI, for which the successful completion of a comprehensive written exam will be required.

Seminar Objectives

1. Understand complexities of measuring EMR in low rise buildings including power system ELF magnetic and electric fields, Power system VLF electric fields and radio frequency radiation.
2. Understand/use specific meters to measure specific EMRs; learn/practice how meters can be used to measure and map EMR in buildings; learn/practice data logging and its uses in the assessment.
3. Study and understand the IBE *EMR Measurement Protocol for Low Rise Buildings*.
4. Learn about various methods of shield/blocking EMR and where each the application criteria for each type of shielding.
5. Learn how to construct and cost a remediation plan for each of these energies.

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Seminar Schedule

Day One, Monday, 3 December: AC Electric Fields

1. Learning Objectives & Seminar Overview
2. ELF & VLF Electric Fields
 - a. Body Voltage Measurement
 - b. Advanced Instrument for 3D Electric Fields
 - c. Measurement Protocol
3. VLF Mitigation with Filters
4. Electric Fields in Office Environments
5. Shielding Options
6. Lab– Electric Fields

Day Two, Tuesday, 4 December: AC Magnetic Fields

1. ELF Magnetic Fields
 - a. Advanced Instrument for 3D Magnetic Field Measurement
 - b. Measurement Protocol
 - c. Data Logging and incorporation in Report
 - d. Source Identification, Frequency Component Analysis
 - e. Four Types of Building Wiring Errors
 - f. Neighborhood Distribution System Fields
2. Lab– Magnetic Fields

Day Three, Wednesday, 5 December: Magnetic Fields Cont'd; Radio Frequency Magnetic Field Remediation

- a. Wiring Errors; Parallel Neutrals
- b. Shielding Theory
2. Radio Frequency Radiation
 - a. Safety Standards; Health Effects
 - i. RF Source Identification including Smart Meter ID
3. Lab- RF Measurement

Day Four, Thursday, 6 December: Radio Frequency

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1. Instruments for RF Measurement
 - a. Measurement Protocol
 - b. RF Data Logging
 2. Sources of Digital Wireless RF
 3. Modulation Technologies: 2G, 3G, 4G, 5G and Measurement Implications
 4. Lab- RF Measurement and Source ID
 5. RF Shielding
 6. Lab- Facility Assessment

Day Five, Friday, 7 December: Report Writing & Case Studies

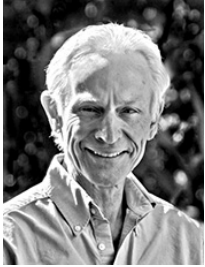
1. Client Communications– Phone & On-site Interaction; Report writing
2. Final Project for BBEC
3. Apprenticeship Program; Business Support Program
4. Q & A
5. Closed Book, Proctored Exam at Noon

Note: The daily schedule may change as planning for the 2016 seminar proceeds

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Meet The Instructors

IBE 312: Advanced Electromagnetic Radiation



Larry Gust is an electrical engineer. Mr. Gust has been teaching classes and seminars for IBE since 1996. He has been conducting on-site assessments, recommending and planning remediation approaches to resolve electromagnetic pollution issues and supervising remediation activity since 1993. Mr. Gust is an electrical engineer, Certified Building Biology Environmental Consultant and Electromagnetic Radiation Specialist. For twenty-five years he was a member of management at Dow Chemical and then at the Mobil Corporation. Mr. Gust has appeared on the *Today Show* and WABC's *New York Viewpoint*. He has spoken at the Scripps-Mende Well Baby Program, the LA Cancer Control Convention, the World Congress on Integrative Medicines. Mr. Gust appeared in *Greenovate* a program on the *Planet Green* Network devoted to environmentally conscious living. He has lectured for the *Electro-smog* seminar hosted by Dr. Dietrich Klinghardt, MD. Mr. Gust has been a guest on numerous radio programs discussing how to create a safer more health supporting home. To contact Larry, please visit: www.healbuildings.com



Rob Metzinger is an Electronics Engineering Technologist, Certified Building Biologist, Certified Electromagnetic Radiation Safety Advisor (CERSA) Consultant, President of Safe Living Technologies Inc. and one of Canada's top EMR Technical Experts. He is also a factory certified Gigahertz Solutions Test Equipment Technician and Instructor. Mr. Metzinger's 20 years experience as an independent corporate electronics field service engineer has yielded him a strong background in electrical and electronic problem solving along with strong customer relation skills. He is considered an authority on all issues related to EMF and RF pollution. Education, Detection and Protection are the three pillars of his business. Rob has taken his 10 years of experience in the field of Electromagnetic Radiation to the next level and has become an educator with IBE. To contact Rob, please visit his website at www.slt.co



Spark Burmaster, BBEC, is an Electrical Engineer and Building Biology Environmental Consultant. Spark developed ElectroMagnetic Education materials for IBE and taught IBE seminars starting in 1991. He has 25 years experience in solving Electrical and ElectroMagnetic problems for the Electrical Sensitive, having first gotten into the discipline via Stray Voltage issues on dairy farms. (Spark is from Wisconsin, the dairy state.)

Currently, Spark is a consultant to Organic Valley for the development of protocols to mitigate Stray Voltage. Way back when, he worked in circuit design for Collins Radio, in Richardson, Texas. Along the way he put up / worked on about 150 Aermotor Water Pumping Windmills, many of them for the Amish. He presents an ElectroMagnetic Exposure Workshop, annually, at the Midwest Renewable Energy Fair, in Wisconsin. He is a co-founder of the ULEME project.

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Venue

IHM Retreat & Conference Center
50 Mount Carmel Road 87505

All students who are not local to Santa Fe, New Mexico are asked to please lodge overnight and dine on campus for the duration of this event. Our caterer stands ready to meet or exceed extraordinary dietary requests.

IBE arranges your lodging and your food via contracts with two separate vendors, and your contract is with IBE, not with its vendors. We must ask that any issues, concerns, or needs you may have regarding your room or your food be addressed to Erik Rosen, our Administrative Director, who will be on-site and available to serve you 24/7.

We make every effort to ensure that the classroom, dining room, commons areas, and overnight guest rooms at this venue meet Building Biology Standards for a health-supporting environment, and this venue's management joins us in our efforts. The WiFi service in the main building, Santa Maria Hall, will be disabled throughout your stay there. The nearest cellphone tower is nearly a mile away. The few magnetic fields in Santa Maria Hall are very localized, fall off quickly, and do not exceed the IBE level for concern. The secondary residential building, San Miguel Hall, *does* have a WiFi signal that emanates from the Archbishop's residence therein. We house only those students who are not sensitive to WiFi in San Miguel Hall. This WiFi signal of course is password protected, and not available for our guest's use.

Nonetheless, please note that no venue situated "on the grid" is entirely ideal. While we have served nearly one hundred IBE students at this venue over the past eighteen months, two of those students did find their guestroom experience incompatible with their environmental sensitivities, and were moved to off-campus accommodations for the remainder of the seminar.

Overview: Tuition and room & board must be paid in advance, please, to the International Institute for Building-Biology® & Ecology. Payment may be arranged online at IBE's website ([click here](#)), or by check, or by calling IBE's executive director (505-428-0901). To pay by check, please mail your payment to: IBE, P.O. Box 8520, Santa Fe, New Mexico 87504.

You are required to arrive the day before classes begin (Wednesday, 30 November) and remain on site through your completion of the final exam, at or around 3:00 PM, Monday, 06 December. You may opt to arrive earlier and/or depart later, at an additional cost (\$105 per night, USD). This is a lodging fee only, as meal service is not available for these extraneous days (the nearest restaurants are one or more miles away). Check-in begins at 3:00 PM on Wednesday; check-out is 10:00 AM Monday, 06 December. To arrange early arrival, or an extended departure date, please contact our administrative director, Erik Rosen, not the venue: <erosen@buildingbiology.net>. (the nearest restaurants are one or more miles away).

There will be a Meet & Greet Wednesday evening, 31 November at 6:30 PM in the venue lobby. At this time, attendees arrange among themselves for an off-site meal or snack, all together or breaking into groups according to their individual dietary and culinary preferences. The nearest restaurant is one mile from the seminar venue. Downtown Santa Fe, with its broad selection of restaurants and cuisines, is situated two miles from the seminar venue.

Arrival/departure: Santa Fe is served by two airports: Albuquerque International Sunport and Santa Fe Regional Airport. Sandia Shuttle serves those arriving at Albuquerque International Sunport with hourly service (8:15 AM to midnight; [click here](#) for schedule) with drop off at the IHM Retreat Center's front door. From Santa Fe Regional Airport there is taxi service only to the IHM Retreat Center. Both airports

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are served by major national rental car companies, on-site.

Rooms: Each student will be provided a private room with private bath. Those who might want to share a two-bed room will save \$20 each per room per night. Students wishing to share must alert IBE's administrative director at least two weeks in advance, at erosen@buildingbiology.net. WiFi will be turned off in all guest rooms, as well as the classroom and dining room; the nearest cellphone tower stands nearly a mile away.

NOTE: The venue does not permit alcoholic beverages anywhere on their property, and all indoor areas are smoke-free. We ask that all students, in consideration of attendees who may suffer from allergies, to please refrain from using/wearing scented personal products.

NOTE: The building directly adjacent Santa Maria Hall, to the west, is the private residence of cloistered nuns, and the building directly east of Santa Maria Hall is the private residence of the Archbishop of the Santa Fe. We ask that you please consider all outdoor areas to be a quiet zone.

Meals: All meals are prepared from scratch, on-site using mostly organic and/or locally sourced free-range ingredients. Vegan, vegetarian, carnivore/omnivore, and gluten-free options are available daily. Meal service (breakfast, lunch, dinner, and between-meal snacks) begins with breakfast Monday morning and ends with Friday lunch. All meals will be prepared and served on-site by Piñon Catering of Santa Fe.. Seminar tuition includes daily lunch; breakfast and dinner are included in the room & board charge (\$755.00 USD).

Please note: Our traditional mid-week group (pay your own food and beverage tab) dinner at an off-site Santa Fe restaurant will be held at an as yet unselected restaurant. You will be advised of the restaurant in plenty of advance time to peruse the restaurant's menu online and determine for yourself whether or not it provides for special dietary needs you may have. This off-site meal will take place Saturday evening, 03 December. We will depart the seminar venue for the restaurant at or around 6:00 PM.

Attire: While Santa Fe is located at a somewhat southerly geographic latitude, it is situated 7,500 feet above sea level. Expect nighttime temperatures dropping as low as 55°, Fahrenheit. Average daytime temperature is 85°. Please dress accordingly (layering recommended), and at your own comfort level (as casual as you please).

Rental cars: Students who drive to Santa Fe or opt to rent a car for the duration of their stay are asked to consider volunteering their driving services for transporting their fellow attendees to and from group's dinner in Santa Fe on Wednesday evening. If you expect to be volunteering this service, please contact IBE's executive director, Michael Conn, at: mconn@buildingbiology.net.