PROGRAM PLAN

June 2016

University of Wisconsin-Madison
College of Engineering
Wisconsin Power Electronics Research Center
2559D Engineering Hall
1415 Engineering Drive
Madison WI 53706-1691
http://www.wempec.wisc.edu/
### Faculty

**Co-directors**

- Professor Robert D. Lorenz  
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- Professor Thomas M. Jahns  
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**Associate Directors**

- Professor Giri Venkataramanan  
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- Ass’t Prof Bulent Sarlioglu  
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- Ass’t Prof Daniel C. Ludois  
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**Emeritus Directors**

- Professor Thomas A. Lipo  
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- Professor Donald W. Novotny  
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### Wisconsin Electric Machines and Power Electronics Consortium  

(WEMPEC)

WEMPEC is an organization of sponsoring companies, with an interest in the general field of electric machines and power electronics, which has agreed to help support the program outlined in this document at the College of Engineering of the University of Wisconsin-Madison.

The Program Plan on the following pages is based on the original WEMPEC Program Plan prepared in 1980 for the formation of WEMPEC. The structure and basic goals of WEMPEC remain essentially as stated in the original plan except that the original goals of the program have been significantly exceeded in terms of the number of students and faculty involved in the program.

A summary of the progress we have made in meeting program goals in the 35 years since WEMPEC was founded has been documented in the commemorative 35th anniversary booklet, “WEMPEC – 35 Years of Collaboration and Innovation 1981-2016,” included on our WEMPEC website.

### Goals of WEMPEC

The sponsors and the faculty directors of the program are dedicated to the development of the best possible educational, research and service program in the area of electric machines and power electronics. Specifically the program goals include:

- Promotion of a strong undergraduate elective program graduating 20-30 B.S. degree recipients per year.
- Sustenance of a strong M.S. and Ph.D. program with students engaged in research in the fields of electric machines, power electronics and AC drives and their applications.
- Provision of excellent instructional and research laboratory facilities.
- Development of a close and productive relationship between the program faculty and students and the sponsoring companies.
| **Faculty** | The primary faculty consist of the following professors:  
- R.D. Lorenz – Co-Director  
- T.M. Jahns – Co-Director  
- G. Venkataramanan – Associate Director  
- B. Sarlioglu – Associate Director  
- D. C. Ludois - Associate Director  
In addition, the following faculty provide assistance to the program as appropriate in specific research and/or teaching projects:  
- R.H. Lasseter – Emeritus Director  
- T.A. Lipo – Emeritus Director  
- D.W. Novotny – Emeritus Director  
Faculty from Electrical and Computer Engineering, Mechanical Engineering, Engineering Professional Development, Mathematics, and/or Computer Science provides support when special needs arise. |
| **Lecture and Laboratory Courses** | Several courses for undergraduate and graduate students that have been developed and offered under the program are described on our WEMPEC website. |
| **Continuing Education** | Several short courses of interest in the field of electric machines and power electronics for practicing engineers are developed and offered by the faculty through the College of Engineering’s Department of Engineering Professional Development and are included on our WEMPEC website. |
| **Online Graduate Engineering Degrees and Certificates** | All the courses of interest to practicing professionals in the field of electric machines, power electronics and controls are offered via distance learning by WEMPEC faculty through the College of Engineering’s Department of Engineering Professional Development, enabling engineers to obtain M.S. and Ph.D. degrees or for their professional development and are included on our WEMPEC website. |
| **Seminars** | A seminar series is organized and includes faculty, students and outside experts, particularly from sponsor companies as speakers. A regularly scheduled seminar is held every Friday afternoon during the academic year. Sponsors are invited to attend any of the seminars held in conjunction with the program at Madison. A current seminar list is included on our WEMPEC website. |
| **Internship Programs** | An internship experience for graduate students is encouraged during summers and regular semesters in industry for interested sponsors. |
| **Generic Research** | The program faculty initiates and carries out an expanded program of graduate student research projects of a basic and widely applicable nature with the support of the program funds provided by the sponsors. Any patents resulting from sponsored generic research are assigned to the Wisconsin Alumni Research Foundation (WARF) and the sponsors benefits are described in the second page of our Memorandum Agreement document posted on our WEMPEC website. |
| **Focused Research Projects** | Specific non-generic research projects are handled on a grant or contract basis. Program funds are not involved in projects of this type. Such projects are handled through the Wisconsin Power Electronics Research Center (WisPERC). |
| **Liaison with Sponsors** | All sponsoring companies are invited to visit the campus at any time. The intent of the visit is to initiate and maintain a close working relationship between the sponsors and faculty of the program. Annual half-day meetings in WEMPEC facilities with individual sponsors on focused topics are encouraged. |
| **Program Review Meetings** | A review meeting of active sponsors, students and faculty is held every year in Madison. Documents that summarize annual progress and cumulative results are distributed. |
| **Information Services** | **Research Reports** – Copies of reports on generic research are made accessible on our WEMPEC website to all sponsors as soon as projects are completed. Publication through normal professional channels is, of course, anticipated. **MS and PhD Theses** – Copies of students' PhD theses and MS theses are provided to sponsors electronically during the annual program review meetings and are accessible on our WEMPEC website to all sponsors. **Students** – Information on the graduate students participating in the program are provided to sponsors on an annual basis. |
| **Consulting** | The program faculty and students are available to provide consulting services, on an appropriate fee basis, to the extent that these services do not conflict with their responsibilities or faculty policies & procedures. |
| **Program Administration** | Administration of the program is the responsibility of the Program Directors. The funds contributed by the sponsors are used to provide: • Research assistant and tuition remission support for graduate students • Funds for research laboratory equipment and computer time • Funds for administrative staff, travel, publication costs, seminar speakers, faculty visits to sponsors, program conferences and other miscellaneous needs • Other appropriate expenses that promote program goals It is the intent of the directors and associate directors to communicate our plans and seek the comments of the sponsors in determining major funding policies and in establishing the direction and content of the teaching and research programs. The primary mechanism (in addition to liaison visits) for sponsor input to program policy is through informal conversations during review meetings and sponsor visits. Final decisions on expenditures, overall program policies, course content, research project topics, and day-to-day operations must, of necessity, reside in the directors and associate directors. |
| **Sponsors Contributions** | To provide flexibility and to better serve the diverse range of size and specialization of potential sponsors, a unit contribution system has been established. Each sponsor may elect to provide from one to five units of support for the program in the amount of $15,000 per year per unit. Sponsors electing to participate in the program do so through payment of the amount and signing the ‘Memorandum Agreement’ included on our WEMPEC website. |