David H. Phillips, Ph.D., P.E., C.W.I.

CAREER SUMMARY

Diverse experience as a welding engineer in the automotive and aerospace industry sectors, in addition to 11 years of technical sales in welding engineering contract research. Currently employed as a Professor of Practice at The Ohio State University. Particular expertise in Resistance and Solid-State Welding processes, dissimilar metal welding, and welding metallurgy of ferrous and non-ferrous alloys.

EDUCATION

Ph.D., Welding Engineering, March 2008
The Ohio State University, Columbus, Ohio
Dissertation title: "Magnetically Impelled Arc Butt (MIAB) Welding of Chromium-Plated Steel Tubular Components Utilizing Arc Voltage Monitoring Techniques"
Advisor: Dr. Charley Albright

M.S., Welding Engineering, March 1986
The Ohio State University, Columbus, Ohio
Thesis title: "A Weldability Study of Cast Alloy 718 Using the Spot-Varestraint Test"
Advisor: Dr. William Baeslack III

B.S., Welding Engineering, March 1984
The Ohio State University, Columbus, Ohio

EMPLOYMENT

THE OHIO STATE UNIVERSITY (current - started September, 2008)

Professor of Practice
Currently teaching (or have taught) multiple Welding Engineering courses and one Materials Science and Engineering course. Course subjects include Survey of Welding Engineering, Resistance and Solid-State Welding Processes, Welding Process Laboratory, Novel and Hybrid Welding Technologies, Metals Processing, Robot Programming, and Welding Metallurgy of Stainless Steels and Nonferrous Alloys. Research activities include leading numerous weld failure analysis projects for the Ohio Manufacturing Institute (OMI).

Industrial Employment and Experience:

DP WELDING ENGINEERING AND INSPECTION SERVICES, LTD. (current)

President
Providing a variety of welding engineering consulting services ranging from the development of innovative Resistance Welding technologies to failure analysis of welded stainless steel tanks. Recent activities include teaching a short course in Welding Engineering to a robotic integration company, weld inspection of welded stainless steel piping, and failure analysis of a weld failure on a truck.

DELPHI ENERGY AND CHASSIS SYSTEMS **(2004-2007)**
The world's largest manufacturer of automotive components

Senior Welding Research Engineer
Responsibilities included conducting welding research and development projects on a variety of Delphi applications, with particular emphasis on Magnetically Impelled Arc Butt (MIAB) Welding and Deformation Resistance Welding (DRW) processes. Concurrently pursued and completed a Delphi-funded Ph.D. in Welding Engineering at The Ohio State University.

EDISON WELDING INSTITUTE **(1992-2004)**
The largest engineering consulting company in the United States which focuses on welding and joining technologies

Market Leader, Aerospace (2001-2004)
Developed, managed, and grew business relationships with key aerospace customers. Generated technology roadmaps and led a team of engineers focused on developing new technologies in welding engineering. Grew the aerospace contract research sales volume from $500,000/year to over $2 million/year.

Industry Team Leader/Market Development Manager (1992-2001)
Identified and sold contract research projects and membership accounts in the aerospace and medical and electronics fields. Gave numerous technical presentations at conferences. Sold two of the largest commercial research projects in the history of the company, totaling $1.75 million.

GE AIRCRAFT ENGINES **(1987-1992)**
A major producer of military and commercial jet engines

Joining Engineer, Advanced Materials
Conducted welding and joining research and development programs on aerospace materials, with particular emphasis on advanced titanium alloys. Worked closely with manufacturing engineering on the transfer of new welding and joining technologies to production.

MOTOR WHEEL CORPORATION **(1986-1987)**
Formerly a major producer of automotive and truck wheels

Corporate Welding Engineer
Corporate welding engineering consultant to six automotive manufacturing facilities of Motor Wheel. Responsible for specifying, down-selecting, trouble-shooting, and purchasing a large gas metal arc welding automated wheel assembly machine. Conducted research in Resistance Spot Welding and Flash Welding of wheels.

HUGHES AIRCRAFT CORPORATION **(1984)**
A manufacturer of welding equipment for the microelectronics industry sector

Welding Engineer
This was a 6-month assignment prior to the beginning of a Master's program. Developed ultrasonic wire bonding process for aluminum wire. Taught a basic metallurgy course to Hughes Aircraft engineers.

TEACHING AT THE OHIO STATE UNIVERSITY

Curriculum Development:

Working in conjunction with Adjunct Professor Darren Barborak, developed a new course in Welding Engineering (WE 4602) titled "Welding Procedure Development and Qualification"

Developed a new course in Welding Engineering (WE 4595) titled "Theory and Application of Novel and Hybrid Welding Processes"

Developed a new course in Welding Engineering (WE 4606) titled "Welding Robot Programming and Operations

Developed a new version of WE 702 (WE 4012/7012) which involved the consolidation and restructuring of the previous WE 602 and WE 702 courses

Developed and incorporated new lab experiments in WE 651 (now part of WE 4002) and MSE 581.04 (MSE 3333)

Developed and incorporated a modification to the new WE 4002/7002 semester course to include all non-arc welding processes

Completely transformed and updated course material for three classes: WE 3001, 4002/7002, and 4012/7012

Courses Taught:

Materials and Science Engineering:

Materials Science and Engineering 581.04 (3333), "Materials Science Laboratory", WI 2009, WI 2010, WI 2011, WI 2012, AU 2012, AU 2013, AU 2014, AU 2015, AU 2016, AU 2017, AU 2018

Welding Engineering:

Welding Engineering 695 (4595), "Theory and Application of Novel and Hybrid Welding Processes", SP 2010, SP 2011, AU 2011, AU 2013, AU 2017

Welding Engineering 300 (3001/2001), "Survey of Welding Engineering", AU 2009, AU 2010, WI 2010, WI 2011, WI 2012, SP 2012, SP 2013, SP 2014, SP 2015, SP 2016, SP 2017, SP 2018, SP 2019

Welding Engineering 601 (4002/7002), "Physical Principles in Welding Processes II", SP 2009, SP 2010, SP 2011, SP 2012, SP 2013, SP 2014, SP 2015, SP 2016, SP 2017, SP 2018, SP 2019

Welding Engineering 651 (now included in 4002/7002), "Welding Processes Lab", SP 2009, SP 2010, SP 2011, SP 2012, SP 2013, SP 2014

Welding Engineering 602 (4012/7012), "Fundamentals of Resistance Welding", AU 2008, AU 2009

Welding Engineering 702 (4012/7012), "Fundamentals of Resistance Welding", AU 2010, AU 2011

Welding Engineering 656 (4606), “Welding Robot Programming and Operations”, WI 2012, SP 2013, SP 2014, SP 2015, SP 2016, SP 2017, SP 2018, SP 2019

Welding Engineering 612 (4102/7102), “Welding Metallurgy II”, WI 2011, WI 2012, AU 2013, AU 2014

Welding Engineering 4901 (50%), “Capstone Welding Design 1”, AU 2013

Welding Engineering 4612/7612, “Welding Metallurgy II Lab”, AU 2014, AU 2016

Teaching Evaluation Credentials:

Average Student Evaluation of Instructors (SEI) score of approximately 4.75/5.0 over an 11 year period:

Year	Course	Enrollment	Average SEI
2008	WE 602	13	4.9
2009	WE 300 #	26	5.0
	WE 602	12	4.9
	WE 651 #	30	4.7
	WE 601 #	33	4.8
2010	WE 300 #	24	4.3
	WE 300 #	12	4.2
	MSE 581.04 #	29	4.9
	WE 601 #	25	4.9
	WE 651 #	22	4.8
	WE 695	19	4.9
	WE 702	28	4.8
2011	WE 300 #	23	4.5
	MSE 581.04 #	18	4.9
	WE 601 #	23	4.9
	WE 651 #	15	4.9
	WE 695	27	5.0
	WE 695	17	4.8
	WE 702	11	4.9
2012	WE 300 #	25	4.6
	WE 300 #	22	4.7
	MSE 581.04 #	24	4.8
	MSE 3333 #	25	4.6
	WE 601 #	24	*
	WE 651 #	24	*
	WE 656	10	*
	WE 612 #	30	4.1
2013	MSE 3333 #	35	4.4
	WE 3001 #	60	4.5
	WE 4002/7002 #	22/2	4.9/*
	WE 4102/7102 #	24/9	4.7/3.8
	WE 4595	21	4.7
	WE 4606	10	*
	WE 4901 #	19	*
2014	WE 3001 #	61	4.3
	WE 4002 #	40	4.8
	WE 7002	11	*
	WE 4102 #	32	4.5

	WE 7102	15	5.0
	WE 4606	10	*
	WE 4612 #	32	*
	WE 7612	3	*
	MSE 3333 #	59	4.7
2015	WE 3001 #	53	4.8
	MSE 3333 #	51	4.8
	WE 4002 #	55	4.7
	WE 7002	6	5.0
	WE 4606	20	4.4
2016	WE 3001 #	46	4.6
	WE 4002 #	50	4.7
	WE 4606	23	4.8
	WE 7002	5	5.0
	MSE 3333 #	51	4.9
	WE 4612/4712 #	50	
2017	WE 3001 #	49	4.7
	WE 4002 #	47	4.9
	WE 4606	22	5.0
	WE 4595	35	4.8
	WE 7002	6	5.0
	MSE 3333 #	51	4.9
2018	WE 3001 #	64	4.8
	WE 4002 #	50	4.7
	WE 4606	23	4.9
	WE 7002	8	5.0
	MSE 3333 #	62	4.8
2019	WE 2001 #	48	4.86
	WE 4002 #	66	4.93
	WE 4606	24	4.73
	WE 7002	10	5.0

* insufficient # of students submitted SEIs
# required (core) course for the major

MENTORING AND GRADUATE COMMITTEE PARTICIPATION

Undergraduate:

Have advised more than 100 undergraduate students participating in Capstone or other volunteer team projects

Currently a team advisor for the OSU NASA Human Exploration Rover Team

In 2018, advised a STEP (Second year transformational experience program) cohort of 16 students

A Capstone team received a James Lincoln Arc Welding Foundation Award

Graduate:

Appointed to Graduate Faculty Category M status in 2010

Served on over 15 MS exam committees and 35 PhD candidacy exams, qualifying exams, or dissertation defense committees since achieving M status in 2010

Have advised approximately 20 graduate students (co-advisor of a PhD candidate, the rest are MS distance students)

SERVICE

Committee Participation:

Currently the Chair of the MSE Department Welding Engineering Undergraduate Studies Committee

Currently a member of the College of Engineering Outcomes and Assessments Committee

Previously a member of the College of Engineering Academic Affairs Committee, and the Academic Affairs Subcommittee B

Served as an IIW (International Institute for Welding) Commission XIV (Education and Training) Delegate in 2017 and 2019

Currently an advisor of the American Welding Society (AWS) Education Committee

Currently a member of the OSU Welding Engineering Alumni Committee

Other Service:

Currently serving as the ABET coordinator for the Welding Engineering program

Currently serving as the Wellness Innovator for the MSE Department

Served on an NSF proposal review panel (2011)

Short Course Development:

Developed the majority of the lecture slides and instructor notes now being utilized by "Weld-Ed", a national NSF-sponsored educational program aimed at developing the welding technician profession (to date, over 200 instructors across the United States have been trained using this material)

Developed a three course (a fourth course is being added for 2015) welding technology certificate program for the United Association which is now taught by Welding Engineering faculty and is funded at approximately $40,000 per year (United Association is made up of over 300,000 members of the skilled labor unions such as welding and pipe fitting)

Developed a 2.5 day short course at LECO Corporation which has become part of their annual training program for their customers

Developed test questions for the American Welding Society Certified Welding Engineer examination

Other Short Course Participation:

Instructor, "Fundamentals of Welding and Weld Metallurgy", LECO Corporation Training Class, 2009, 2010, 2011, 2013

Instructor, "Welding Technology Training Course" given to Nuclear Regulatory Council inspectors, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018

Instructor, "Titanium Welding Seminar" given to medical products engineers, 2009

Instructor, “Welding Fundamentals for Code Applications” given to United Association instructors, 2010, 2011, 2013, 2014, 2015, 2016

Arc Welding Seminar given to automotive engineers, 2005

Welding technology instructor for American Society for Metals, 1990

Graduate Teaching Assistant, Welding Engineering Program, The Ohio State University, 1985
Welding Engineering 501, 502, and Robot Welding Laboratory

Educational Grants and Funded Projects at The Ohio State University Since 2010:

Ohio Manufacturing Institute (2011-2014) Total grant: $44,450 – P.I. fraction: 0.93 – "Multiple Small Projects Including an Investigation of Resistance Spot Welding Electrodes"

United Association (2011-2017) Total grant: $300,000 (approximate) – P.I. fraction: 0.40 (approximate) – "For Teaching 'Course #1 – Welding Processes' of Four Course Welding Technology Certificate Program"

Weld-Ed (2012-2014) Total grant: $37,012 – P.I. fraction: 1.0 - "Development of Weld-Ed Instructional Material Including Lecture Slides and Instructor Notes"

IMJSEA (2010-2015) Total grant: $129,000 – P.I. fraction: 0.50 – "Welding of High Strength Aluminum Alloys"

Ohio Manufacturing Institute (2011 – 2013) Total grant: $33,991 – P.I. fraction: 0.93 – "Multiple Small Projects Including Failure Analysis of Laser Welded Titanium Medical Component"

Navy (2011-2012) Total grant: $7,282 – P.I. fraction: 1.0 - "Chromium-Free Weld Filler Metal Final Report"

Weld-Ed (2011-2012) Total grant: $14,960 – P.I. fraction: 0.33 – "Development of Weld-Ed Instructional Material Including Lecture Slides and Instructor Notes"

Ohio Board of Regents (2012) Total grant: $37,500 – P.I. fraction: 0.33 – "Grant Award for Purchasing Fronius Cold Metal Transfer Gas Metal Arc Welding Machine"

EWI (2013-2018), Total grant: Approximately $150,000 - P.I. fraction: approximately 0.5 - "Welding Technology Training Course for NRC Inspectors"

Consulting Services:

Established a company (LLC) that provides engineering services

Continue to consult at approximately $10,000 - $30,000 per year on a variety of projects ranging from failure analysis to training

PUBLICATIONS

Text Books:

Published (sole author) a textbook under contract with Wiley in February of 2016 titled "Welding Engineering: An Introduction" (now a required textbook for WE 3001)

Published (co-author) a textbook under contract with Morgan and Claypool Publishing in September of 2017 titled "Spot Welding in the Automotive Industry"

Currently serving as a Copy Editor to develop a series of Welding Engineering textbooks for Morgan and Claypool Publishing

Welding Journal:

Principal author on a Welding Journal article published in 2014 on the OSU Welding Engineering Program

Technical Papers:

1. L.C. Mallory, W.A. Baeslack III, **D.H. Phillips**, “Evolution of the Weld Heat-Affected Zone Microstructure in a Ti-48Al-2Cr-2Nb Gamma Titanium Aluminide”, Journal of Materials Science Letters 13, 1061-1065 (1994)

2. L.C. Mallory, W.A. Baeslack III, **D.H. Phillips**, T.J. Kelly, “Gas Tungsten Arc Welding of a Ti-48Al-2Cr-2Nb Gamma Titanium Aluminide”, Titanium ’92 Science and Technology, Proceedings, Symposium at 7th World Titanium Conference, San Diego, Vol.2; 29 June-2 July 1992, 1115-1122, (1993)

3. **D.H. Phillips**, W.A. Baeslack III, “Selection and Weldability of Advanced Titanium-Base Alloys”, ASM Handbook Volume 6, Welding, Brazing, and Soldering, 524-528, (1993)

4. M.C. Juhas, W.A. Baeslack III, H.L. Fraser, P.L. Threadgill, **D.H. Phillips**, T.F. Broderick, “Interface Characteristics of Solid Phase Welds Between Ti-6Al-2Sn-4Zr-2Mo-0.1Si and 14Al-21Nb Titanium Aluminide” Titanium ’92 Science and Technology, Proceedings, Symposium at 7th World Titanium Conference, San Diego, Vol.2; 29 June-2 July 1992, 1453-1460, (1993)

5. K.N. Hou, M.C. Juhas, W.A. Baeslack III, H.L. Fraser, **D.H. Phillips**, “An Electron Microscopy Study of Inertia-Friction Welds in Ti-48Al-2Cr-2Nb Gamma Titanium Aluminide”, International Trends in Welding Science and Technology, Gatlinburg, Tennessee, 1-5 June 1992, 1135-1137, (1993)

6. W.A. Baeslack III, **D.H. Phillips**, G.K. Scarr, “Characterization of the Weld Heat Affected Zone in an Alpha-Two Titanium Aluminide”, Materials Characterization, Vol. 28, no. 1, 61-73 (1992)

7. W.A. Baeslack III, **D.H. Phillips**, C. English, A.P. Woodfield, “Inertia-Friction Welding of an Advanced Rapidly Solidified Titanium Alloy”, Journal of Materials Science Letters 10, 1401-1408 (1991)

8. S.A. David, J.A. Horton, G.M. Goodwin, **D.H. Phillips**, R.W. Reed, “Weldability and Microstructure of a Titanium Aluminide”, Welding Journal, Vol. 69, no. 4, 133s-140s, (April, 1990)

PROFESSIONAL CERTIFICATIONS

Licensed Professional Engineer (P.E.), State of Ohio, Welding Engineering
Certified Welding Inspector (C.W.I.), American Welding Society
International Welding Engineer (I.W.E.), International Institute of Welding
Six Sigma Green Belt certified

AWARDS AND HONORS

Adams Memorial Award for Teaching Excellence, 2017, American Welding Society
MacQuigg Award for Teaching Excellence in the College of Engineering at Ohio State, 2017
MSE Department Teaching Award in 2013
Central Ohio “Topcat” Most Innovative Technology Team Award, 2002
GE Inventor’s Award, 2000
GE Engineer’s Day Nominee, 1991
Highest Grade in the State Award, Professional Engineering Exam, 1991
Hughes Aircraft Fellowship Award, 1984