COL Timothy M. Hodges, PhD, PE
Professor of Mechanical Engineering

1. Name and Academic Rank

Hodges, Timothy Mark – Professor of Mechanical Engineering

2. Education

B.S., Civil Engineering, Virginia Military Institute, May 1980
M.S., Mechanical Engineering, Montana State University, December 1982
Ph.D., Mechanical Engineering, University of Virginia, August 1990

3. Years of Service, Dates of Original Appointment and of Advancement

Years of service:	32
Original appointment:	Instructor, 2nd Lieutenant, May 1980
Academic rank:	Instructor, Captain, January 1983
	Assistant Professor, Major, Aug. 1985
	Associate Professor, LTC, August 1991
	Professor, COL, August 1995
	Professor and Head, COL, August 2001
	Professor, Head, and Engineering Division Coordinator, COL, August 2002
	Professor and Head, COL, August 2009
	Charles S. Luck, '20, Institute Professor, August 2010

4. Other Related Experience

Virginia Department of Highways and Transportation, Summer 1978

Corps of Engineering, U.S. Army
May 1980 - May 1981, Reserve
May 1981 to September 1981, Active
September 1981 to June 1985, Reserve

Instructor, Mechanical Engineering Department, University of Virginia, September 1987 to May 1990.

Visiting Professor, School of Science and Engineering, Al Akhawayn University, Morocco, January 1999 to June 1999.

5. Consulting and Patents

James W. Osborne, Attorney at Law, Lexington, Virginia, Automobile Accident Investigation, 1985.

John M. Claytor, Attorney at Law, Dr. Richard S. Trandel, P.E., Richmond, VA, Automotive Trailer Accident Evaluation, 1992.

Buckner, D. and Hodges, T.M., "Investigation Using Finite element Analysis of a Reinforced Concrete Pile Cap", New Orleans Consulting Firm, 1994.

Scott W. Wilson, Attorney at Law, Richmond, VA, "Accident Investigation of a Paper Roll Machine", 1996

Susan B. Read, Attorney at Law, Staunton, VA, "Accident Investigation of a Wire Rope Failure", 1997.

Ellen Arthur, Attorney at Law, Lexington, VA, "Guarding Failure Accident Investigation of an Air Compressor", Spring 1998

Tracy Hudson, Attorney At Law, Warrenton, VA, "Leg Press Accident Investigation", Spring 2001

Jim Joyce, Attorney at Law, Roanoke, VA, "Bean Bag Impact Injury Investigation", Summer 2001

Nichols Engineering Hall Project Manager, 2000-2008

Marshall Hall, Center for Leadership and Ethics, Owner's Representative, 2007-2008

6. Registration: Registered Professional Engineer, Virginia - 0402 015756

7. Publications

Hodges, T.M., "The Improvement of the Reduced Coordinate Iterative Procedure for the Solution of Simultaneous Equations", Masters Thesis, Montana State University, 1982.

Sheth, P.N., Hodges, T.M., and Uicker, J.J., "Matrix Analysis Method for Direct and Multiple Contact Multibody Systems", Journal of Mechanical Design, June 1990, Vol. 112, pg. 145-152.

Hodges, T.M., "Matrix Analysis Method for Direct and Multiple Contact Multibody Systems", Ph.D. Dissertation, University of Virginia, August 1990.

Hodges, T.M., Sheth, P.N., "Toward a New Modeling Paradigm for Constrained Mechanical Systems", Journal of Mechanical Design, March 1994, Vol. 116, pg. 80-87.

Hodges, T.M., and Hardin, JM, "Tenure and Promotion Requirements: Large Universities vs. Small Colleges", Proceedings of the ASEE Annual Conference (Chicago, June 2006.)

Hodges, T.M., and Hardin, J.M., "Composites in Undergraduate Education: An Improved Understanding of Mechanics", Proceedings of the ASEE Annual Conference Louisville, 2010.

Hodges, T.M., and Baker, E. W., "Undergraduate Research: Does it promote graduate education? Creating future graduate students in engineering." Proceedings of the International ASEE Annual Conference, San Antonio, TX, 2012.

Project Development Funding

"Conversion of IC Engine Vehicle to Electric Drive System", Funding provide by VDOT, Student Projects Advisor for 4 different projects over 1994-1998 time frame.

"Instron Material Testing Machine Experiment Development", Technology in Teaching Grant, 1998

"Development of Planetary Gear and Reciprocating Mechanism Labs for ME 423 Machine Design II",

Faculty Development Committee, 2000.

"ANSYS Finite Element Software Purchase Proposal" Berry Fund, 2001

"Web Based Tutorial for ME 458 Seminar", Technology Mini-Grant, 2002.

"ANSYS Finite Element Software Training", Technology Mini-Grant, 2003.

Reports

- Mechanical Engineering Department Report 2000-2001, submitted to the Academic Planning and Review Committee. (Rated Excellent by APRC)
- Mechanical Engineering Department Report 2001-2002, submitted to the Academic Planning and Review Committee. (Rated Excellent by APRC)
- Mechanical Engineering Department Report 2002-2003, submitted to the Academic Planning and Review Committee. (Rated Excellent by APRC)
- Mechanical Engineering Department Report 2003-2004, submitted to the Academic Planning and Review Committee. (Rated Excellent by APRC)
- Mechanical Engineering Department Report 2004-2005, submitted to the Academic Planning and Review Committee. (Rated Excellent by APRC)
- Mechanical Engineering Department Report 2005-2006, submitted to the Academic Planning and Review Committee. (Rated Excellent by APRC)
- Mechanical Engineering Department Report 2006-2007, submitted to the Academic Planning and Review Committee. (Rated Excellent by APRC)
- Mechanical Engineering Department Report 2007-2008, submitted to the Academic Planning and Review Committee. (Rated Excellent by APRC)
- Mechanical Engineering ABET Program Self Study, June 2006, submitted for review by visiting ABET team.
- Institutional ABET Self Study, June 2006, submitted for review by the visiting ABET Team.

The ABET team visited in October 2006. The Department and Division did very well with only minor concerns. The Mechanical Engineering program and the Division received a full accreditation.

8. Professional Societies

American Society of Mechanical Engineers,
Member ASME Department Heads, 2001-2010
Member, 1985- present
Shenandoah Section Chairman in 1991-92
Shenandoah Section Vice Chairman/Treasurer in 1990-91
Shenandoah Section Treasurer in 1988-90
Shenandoah Section Secretary in 1986-88
American Society for Engineering Education
Member ASEE Department Heads, 2001-2010
Member, 2001 – present
Society of Automotive Engineers
Virginia Society of Professional Engineers
National Society of Professional Engineers
ASME Region IV Mechanical Engineering Head Representative
ASME Student Design Committee Member 2009-2010

ASME Student Design Committee Chairman 2010-present
ABET Program Evaluation for ASME 2011-present

9. Honors and Awards

Tau Beta Pi - National Engineering Honor Society
Phi Kappa Phi - National Honor Society
Who's Who in Engineering Education
Who's Who Among America Teachers
Thomas Jefferson Young Faculty Teaching Award - 1992
Institute Distinguished Teaching Award – 1997
Institute Achievement Medal (1st Award) – 2006
Wilbur S. Hinman Research Award - 2007
Institute Achievement Medal (2nd Award) – 2008
Charles S. Luck, Jr. '20 Institute Professor - 2010

10. Institutional and Professional Service

Chairman Faculty Club, 1992
Chairman of the Director of Admissions Search Committee, 1994
International Programs Concept Committee, 1996
VMI Summer Honor Court Prosecutor, 1996
Academic Committee for the Capital Campaign Case Study, 1996-1997
Facilities Committee for the Assimilation of Women, 1997
Bookstore Selection Committee, 1996, 1998
Tenure and Promotions Committee Member, 1998-2000
Dean Search Committee, 2000 -2001
Fall 2000 Symposium Committee, 2000
Academic Week Study Committee, 2001
Tenure and Promotions Committee Chairman, 2001
Institute Pilot Admission Initiative – 2002
Ad Hoc Institute Advising Committee, 2002
Institute Scholars Committee, 2002
Ad Hoc Mathematics Review Committee 2002
Advisor Tau Beta Pi – 1990 - Present
Head of Mechanical Engineering – 2000- 2010
Academic Board – 2000-2010
Curriculum and Instruction Committee – 2001-2002 2007-2008
Member of Academic Planning and Review Committee – 2003-2007, 2009-2010
Engineering Division Coordinator – 2002 - 2009
Nichols Renovation Coordinator – 2000-2008
Institute Assessment Committee – 2006- Present
Search Committee for Assessment and Institutional Research Analyst – 2008
Owners representative for Marshall Hall: Center for Leadership and Ethics – 2007-2008
Chief of Staff Search Committee 2009
Member of Committee of Engineering Department Heads 2009-2010
Member Tenure and Promotions Committee –2011
Member of CCOC – 2011-present

11. Professional Development Activities

- Fundamentals of Gear Design - University of Wisconsin Extension Service, June 1985.
- Fracture Mechanics Approach to Life Prediction - ASME Continuing Education , January 1998
- ABET 2000 Training for Accreditation Visit, July 1998
- National Council of Examiners for Engineering and Surveying (NCEES) Cut Score Evaluation, June 2002
- NCEES PE Examination Preparation Study, October 2002
- NCEES FE Examination Content Evaluation Study, October 2003
- ASME Mechanical Engineering Department Heads – Region IV Representative 2003-2005
- ABET 2005 Commission Summit Training
- ASME Mechanical Engineering Department Heads Education Meeting – Annually
- ABET Training – annually at the ASME Department Head meeting
- US ARMY ROTC Training for Faculty Ft. Lewis Washington 2007
- ABET Best Assessment Practices 2009
- ABET Assessment Planning: Developing Rubrics 2009
- Engineering Dean's Public Policy Colloquium – 2001-2009
- ASME Student Design Committee (Chair) 2010-present
- ASEE Paper Reviewer for Mechanics and Mechanical Engineering Division 2005- present
- ABET Program Evaluator – 2011-present

12. Cadet Development

National Society of Professional Engineers Student Chapter Advisor, 1995
Superintendent's Representative to the Honor Court (Assistant), 1990-1995
Advisor to Class of 2000
Officer-in-Charge in Barracks, Spring 1986, 1987, 1991, 1992, 2001
Summer Session Barracks Supervisor 1987, 1991, 1992
Kappa Alpha Order – VMI Beta Commission Chairman 1998-2008
Tau Beta Pi – one of several advisors
Engineering Division Recruiting Representative for Football Program
Tutor for Athletes
Personal Advisor for assigned Mechanical Engineering Cadets in all four classes
New Cadet Advisor
Department Head - Advisor to all ME cadets on many issues.
Advisor to Faculty on all Cadet Development and Advising issues
Super mileage Team Advisor 2002-2003
Mini-Baja Team Advisor 2006-2007
Assistant Golf Coach – 2010-present

13. Courses Taught

Introduction to ME
Basic Drawing
Descriptive Geometry
Computer-Aided Drawing
CAD Applications and Solid Modeling
Statics
Dynamics
Materials Lab
Solid Mechanics
Fortran Programming

MathCAD and C++ Programming
Programming Tools for Mechanical Engineers (MatLAB and MathCAD)
Thermal Science for Non-ME Majors (taught in Morocco)
Materials
Mechanisms
Dynamics of Machinery
Machine Design I
Machine Design II
Advanced Mechanical Design
Manufacturing
Composite Materials
Mechanical Vibrations
Mechanical Engineering Design (Capstone Design Class)
Seminar I
Seminar II

VMI hired me immediately after I graduated in 1980 under the sub-professor program. I was one of four faculty that began the development of the Mechanical Engineering program. The first graduate with a degree in ME was in 1985. I was one of the architects of the ME degree. I have touched many of the courses currently being taught in ME.

Undergraduate Research Projects Advised

- "Razor Blade Scrap Reduction", Ahrens, Layton, Manning; American Safety Razor Co, 1991
- "Waste Film Collection System", McClung, McKenna, Owens; Hollister, Inc, 1992
- "Push Arm Conveyor System", Lee, Stills, Yoeun; Automated Conveyor Systems, 1993
- "Fixture for Welded Burner Assembly", Gudz, Busic; Modine Manufacturing, 1994
- "Conversion of IC Engine to Electric", Mayo, Johnson, Richardson; VMI, 1995
- "Alternate Bleached Paperboard Design", Johnson, Holland, Danielson; Westvaco Co., 1996
- "Gear Enclosure Design for Paper Drying Machine", Duckworth, Bass, Edmunds; Georgia Pacific Corp, 1997
- "Geometric Redesign of a Remote Snare Guide Tube", Cox, Lorence, Gibson; Framatome Technologies, 1998
- Al Akhawayn University Exchange, 1999
- "Positive Locking Median Barrier Investigation", Lee, Chandler, Stewart; Rockingham Precast Concrete, 2000
- "Frame Flipping Process Redesign", Frye, Christensen; DesChamps Labs, 2001
- "Sewer Rat Camera Transporter", Gupta, Gunter, Graham; Lexington Department of Public Works, 2001
- "Coagulation and Flocculator Machinery Upgrade", Collamore, Chan, Griffith; Maury Service Authority, 2002
- "Supermileage Vehicle Design Prototype", Swank, Bartles, Samms, Murphy; VMI, 2003
- "Base-X Connecting Hub Analysis", Erwin, Kendzior, Ienco, BMI Industries; 2004
- "Reactor Vessel Head Stud Rack Design and Analysis", White, Manley, McGraw, AREVA, 2005
- "The Heat Exchanger Assembly Project", Hunt, Miller, Miner, Des Champs, 2006
- "Cylinder Head Port Design and Modification", Tibbs, Hefner, 2006
- "Modification of a restricted Engine to Optimize its performance and Power Output", Cunningham, SURI 2006 (Won best Engineering Poster)
- "Mini –BAJA Vehicle Competition Team", Lead Advisor, Mitchell, Shea, Wu, Strasser, Burns, Porter, Williams, Raffeale, Shih, Gottwald, Childrey, 2006-2007

- “Snow Loading Analysis of a Base-X Expedition Shelter”, Trask, Costello, Pfrogner, 2009.
- “Steering Wheel Sensor”, Quarles, Ong, Weimer, 2010
- “VideoGrammetric Analysis of Flapping Wing Micro Air Vehicles”, Bost, SURI 2010
    a. This was also published in the New Horizons. April 2011
- “Title: Wire Rope Connection Design”, Ausborn, Crowder, and Chisholm, 2011
- “A Medical Advancement Sure to Increase Life Expectancy”, Dongieuex,, VCU/VMI Summer 2011.
- “Roller Coaster: Design and Analysis”, Adams, 2011

14. Community Service

- Valley Program for Aging Services Board
- New Monmouth Presbyterian Church Choir
- New Monmouth Presbyterian Church Session