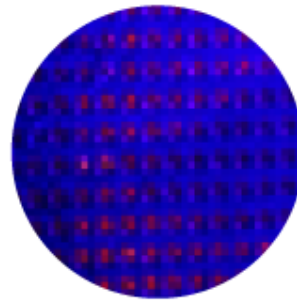
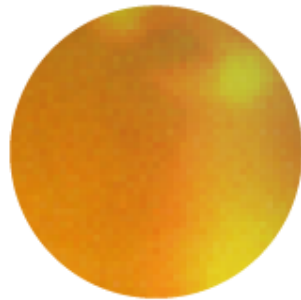
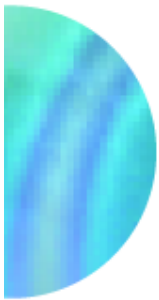




UNIVERSITY OF MARYLAND
HONORS COLLEGE

THE MARYLAND CYBERSECURITY CENTER

Advanced Cybersecurity Experience for Students (ACES) Program



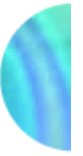
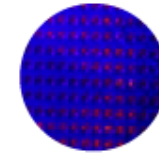
Michel Cukier
Director, ACES
Associate Director for Education, MC2

Michael Hicks
Director, MC2

UNIVERSITY OF MARYLAND



ACES in (Almost) One Sentence



ACES is an intensive and interdisciplinary program for studying cybersecurity from several angles, covering technology, policy, and social and behavioral aspects. With support from Northrop Grumman, ACES will provide students with unique opportunities to gain hands-on experience; interact with industry, government, and academic experts; intern with leading providers of cybersecurity solutions; and learn in state-of-the-art laboratories and facilities.



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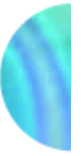
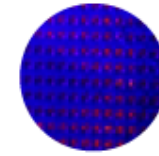
Goals



- Prepare students to be leaders in an emerging, interdisciplinary field that requires practical application and real world experience
- Develop deeper collaboration with industry through research-immersion experiences that provide high engagement in STEM degree fields and prepare students to immediately enter the cybersecurity workforce
- Increase the persistence of students in STEM fields



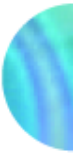
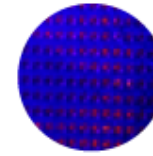
Curriculum Overview



- ACES consists of two linked academic programs over the course of four years:
 - A freshman-sophomore living-learning program leading to an Honors College Citation in Cybersecurity, (ACES I, 14 credits)
 - An upper-level program in Cybersecurity (ACES II, 16-17 credits)
- Each class cohort will be comprised of 40-45 students



Prince Frederick Hall



- Available Fall 2014
- Dorm for ACES I students
- ACES lab, seminar rooms, conference rooms
- ACES office suite



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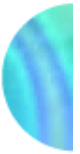
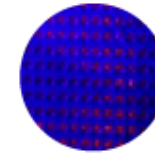
ACES Students



- About 70% expected to be CE/CS students
 - ACES students will be among the top CE/CS students
- Goal: 30% ACES students women/minority
 - CS: 5.6% women and 13.5% minority now
 - Honors: 49.5% women and 17.5% minority now
- Goal: ACES will help improve retention of women/minority students



ACES I: Curriculum



Year	Courses	Description	Cr.	Gen.Ed.
1st yr	HACS 100 Foundations of Cybersecurity I (2 cr)	Fall	2	
	HACS 102 Foundation of Cybersecurity II (3 cr)	Spring	3	SIP
1st & 2nd yr	HACS 208 Seminar in Cybersecurity	Choose 2	6	
	A. Cyberspace - Current Policy, Legal Issues, and Implications		3	HS, I-Series
	B. Cybersecurity Global Economic and Political Impacts		3	HS, I-Series, D-UPS
	C. Cybercrime - The Crime, The Hacker, and the Victim		3	HS, I-Series
2nd yr	HACS 278 Cybersecurity in Practice		3	SIP or Exper.Lear.



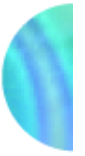
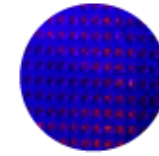
ACES I: Experiential Learning



- HACS 278 Cybersecurity in Practice (year 2)
 - Internship with
 - an MC2 corporate partner such as Northrop Grumman
 - an MC2 government partner
 - Division of IT on campus
 - Study abroad/research opportunity related to cybersecurity
 - Leadership role on the Maryland Cybersecurity Competition Team



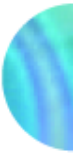
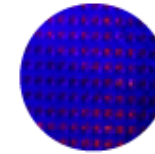
Impact to CS Students/ Faculty



- HACS 100/102 are new honors courses
- HACS 100/102, HACS 208, and HACS 278 help fulfilling general education requirements
- HACS 208 seminars not taught by CS faculty
- Interested CS faculty could teach HACS 100/102
- Interested CS faculty could work with ACES students on research projects (HACS 278)



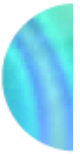
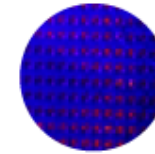
ACES II: Curriculum I



Year	Courses	Description	Cr.	Gen.Ed.
3rd and 4th yr	HACS 408 Cybersecurity Professionals Colloquium Series		1-2	
3rd or 4th yr	Upper-Level Technical Coursework in Cybersecurity	Choose 2	5-6	
	ENEE 359R Intermediate Topics in Computer Engineering: Reverse Engineering		2	
	CMSC 414 Computer and Network Security		3	
	ENME 442 Information Security		3	
	HACS 404 Tools for Information Security		3	
	CMSC 417 Computer Networking		3	
	CMSC 498B Secure Maryland		3	



ACES II: Curriculum II

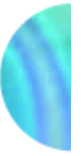
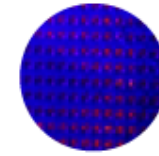


Year	Courses	Description	Cr.	Gen.Ed.
3rd or 4th yr	Capstone in Cybersecurity	Choose 3	9	
	HACS 478 Experiential Learning in Cybersecurity		3	SIP or Exper.Lear.
	HACS 479 Research in Cybersecurity			SIP or Exper.Lear.
	HACS 208 Seminar in Cybersecurity (3 cr) (Students who did not participate in ACES I must take at least 3 credits of HACS208. A maximum of 6 credits of HACS208 can be applied toward the minor.)		3	





ACES II: Experiential Learning I



- HACS 478 Cybersecurity in Practice
 - Internship with
 - an MC2 corporate partner such as Northrop Grumman
 - an MC2 government partner
 - Division of IT on campus
 - Study abroad/research opportunity related to cybersecurity
 - Leadership role on the Maryland Cybersecurity Competition Team





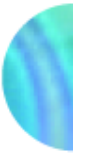
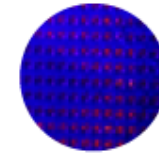
ACES II: Experiential Learning II



- **HACS 479 Research in Cybersecurity**
 - Individual and group research projects which should be (at least somewhat) interdisciplinary
 - Normally be supervised by at least one faculty member affiliated with MC2
 - Research requires approval by the faculty mentor(s) and the ACES Director



Impact to CS Students/ Faculty



- Interested CS faculty could teach HACS 404
- Interested CS faculty work with ACES students on research projects (HACS 479)
- Most ACES students will take the ACES II courses in their department, little size increase expected for CS courses in ACES II



Timeline



- June 2012: \$1.1 million gift from Northrop Grumman
- August 2012: Eng/CMNS Deans approval for ACES I
- August 2012: Submission of ACES I to the Living and Learning Oversight Committee
- Fall 2012: Consolidation of ACES II
- Fall 2013: Launch of ACES I (temporary dorm: LaPlata)
- Fall 2014: Launch of ACES II and move of ACES I to Prince Frederick Hall



Conclusions



- ACES will provide new opportunities for CS faculty and students to teach and research advanced topics
- ACES will assist in bringing in high quality students to CS
- ACES will help to bring in and retain women and minority CS students
- ACES will create connections to industry and labs that will benefit all of CS
- ACES will develop curriculum that will filter into regular CS classes, benefitting students beyond the ACES cohort

