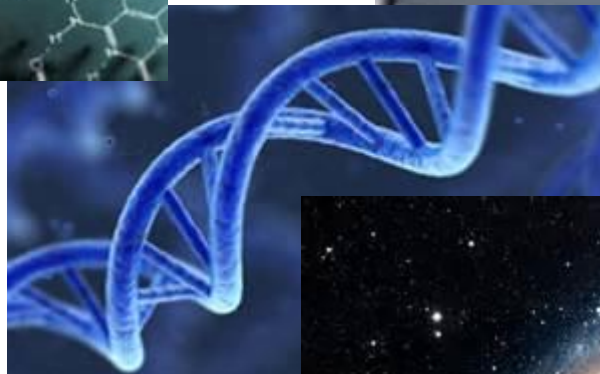
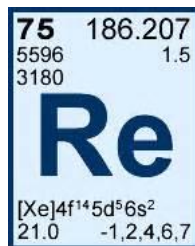
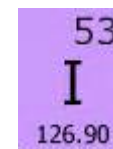
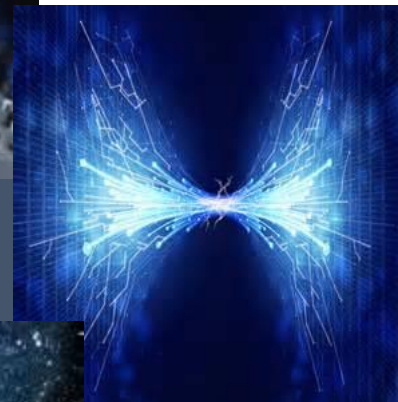


R¹I

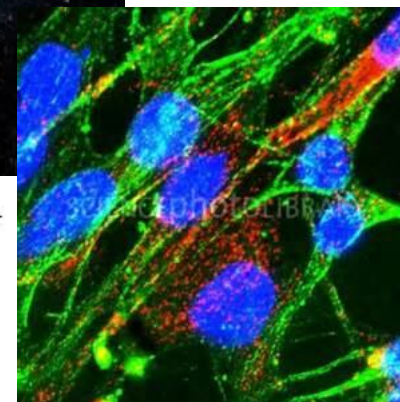


RFI



$$i\hbar \frac{\partial}{\partial t} - \Psi = \hat{H}\Psi$$

$$-\frac{\hbar^2}{2m} \left(\frac{\partial^2 \psi}{\partial x^2} + \frac{\partial^2 \psi}{\partial y^2} + \frac{\partial^2 \psi}{\partial z^2} \right) + V(x, y, z) \psi = E \psi$$



RESEARCH 1ST INITIATIVE

RESEARCH FIRST INITIATIVE: *What is the RFI?*

RFI is an immersive Research & Mentoring Program designed to attract and retain students in the STEM fields

- Students learn science by “*DOING*”
 - RFI engages students, starting as Freshman, in real time faculty-sponsored laboratory research
 - Experimental science incorporated into courses – changing the way we teach science

- Provides students with the opportunity to “*experience scientific Discovery*”
 - Allows students to “*identify as scientists*”
 - Builds confidence through success in utilizing scientific concepts in real time
 - Teaches collaboration, team work and the multidisciplinary nature of science

- Provides “mentorship” throughout their college research experience & beyond
 - Helps retain & graduate students in STEM field
 - Offers training, real job related experience & internship opportunities in research, making students more attractive to employers.

RESEARCH FIRST INITIATIVE: *Why Enroll in RFI?*

- **Transformative learning experience**

- Learn by doing. Builds confidence & identity as a scientist
- Moves away from lecture-based rote learning & memorization
- Learn by conducting actual scientific research & collaborative nature of science
- Promotes use of knowledge in critical thinking & problem solving

- **Mentoring Program**

- Builds strong student faculty relationships
- Small group / class interactions promotes engagement & confidence
- Develops problem solving & critical thinking skills
- Collaborative environment – reinforces team oriented approach to science

- **Real-life Advantages & Value to Students**

- Top-tier graduates are highly sought after by employers
- Exposure to real-time, real-life research - - helps you decide best career path
- Can differentiate you from others
 - Receive RFI “Certificate of Research Distinction” upon graduation & on transcript
 - Research experience highly attractive to employers
- Experienced workers command higher salaries & better job opportunities

4 yr College Degree	Jobless Rate (2012)	Starting Salary (2012)
STEM	3.2%	\$79,000
Non-STEM	8.2%	\$41,000

STEM Field Job Growth* (2004 – 2014)

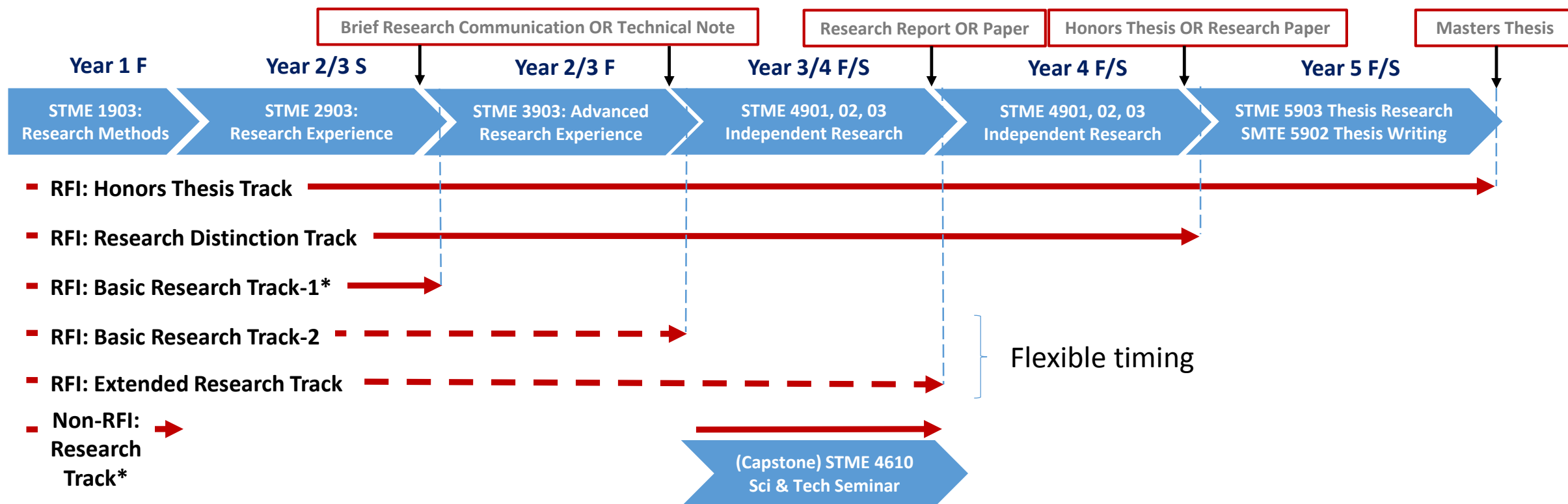
Core STEM (Math, Eng & Computer Sci)	Health STEM (Sci, Med, Nursing)
↑19% [†]	↑100%

*Non-STEM job growth was flat (0% growth)

[†]IT jobs declined 18%

Source: President’s Council of Advisors on Sci & Tech)

RESEARCH FIRST INITIATIVE: *Proposed Tracks*



*minimal requirement

RESEARCH FIRST INITIATIVE: *Research Streams*

STME 2903: Research Experience

Research Streams - Spring 2015-16 AY

- Cell Signaling Pathways in Cancer Cells (Dr. S. Coniglio, NJCSTM)
- Identification of Natural Products and Drug Metabolites by Mass Spectrometry (Dr. D. Ramanathan, NJCSTM)
- Microbes & Microbiomes (Dr. M. Hayes, NJCSTM/ILSE: ATCC-CTM)
- Medicinal Chemistry (Drs. H. Stokes-Huby & Merritt, CNAHS / NJCSTM)
- Modeling of Non Linear Wave Systems in Fiber Optic Communication (Dr. Farnum, NJCSTM)
- Bioinformatics (Dr. Sun, NJCSTM) under development AY 2016/17
- Advanced Medicinal Chemistry: CCRI antagonism (Drs. Merritt & Coniglio, NJCSTM) under development AY 2016/17

RESEARCH FIRST INITIATIVE: *Admission*

Student Admission Criteria

- Overall GPA of 3.0, with a 3.25 GPA in science & mathematics
 - Proficiency in mathematics
 - AP science & math courses or HS research experience desirable

- Interview with faculty stream leader(s) and/or RFI Admission Committee
 - Exceptions subject to Faculty & RFI Admissions Committee review.

- Prerequisites for Advanced RFI Research Streams
 - High School Advanced Placement course(s) in field related to RFI research stream or research experience.
 - *i.e.*, Biology, Chemistry, Physics, Earth Sciences, Computer Sciences or Mathematics (Calculus)
 - GSSRP, Science club, Research camp or project
 - Pre-requisite undergraduate courses may be required for entry into advanced research streams such as chemistry, bioinformatics or astrophysics. Faculty mentors determine pre-requisite course(s) for their research stream.
 - *i.e.*, organic chemistry 1, Java programming, calculus & differential equations
 - Exceptions subject to Faculty & RFI Admissions Committee review.