Interdisciplinarity in Astronautics at HIT

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Curricula

- **Disciplines in School of Astronautics at HIT**
  - Aeronautical and Astronautical Science and Technology
  - Control Science and Engineering
  - Mechanics
  - Optical engineering
  - Electronic science and technology

- **Composition of credits:**
  - **Undergraduates:** 170~175 in total
    - general education: 70~75; professional: 85~90; individualization: ~10
    - courses from other depts. as in ME, EE, CS, MS, etc.
  - **MS Graduates:** ~32 in total (2-3 years)
    - degree courses: ~16; elective courses: ~7; others: 9
  - **PhD Graduates:** ~14 in total (4-6 years)
    - degree courses: ~2; elective courses: ~4; others: 8

- **Interdisciplinarity in Astronautics**
  ------- an intrinsic property
Credits for the first two years
(100~105)

- **Professional field**: 5~10

- **General education**: 65~70
  - history, culture, language, PE, etc.: 30~32
  - science (35~38)
    - Math – 23 (calculus, algebra, geometry, probability, computation, complex function & integral transformation)
    - Physics – 12 (theory & experiments, 12)
    - Chemistry – 3

- **Other engineering fields**: 15~25
  - Computer – 5 (college computer, C programming)
  - Mechanics – 2~10 (theoretical mechanics & mechanics of materials)
  - Mechanical Engr. – 5 (engineering drawing, smithcraft practice)
  - Electrical Engr. – 3~7 (electrotechnics & Experiment)
Credits for the last two years (70~75)

- **Professional field:** 60~65

- **General education:** ~2 (culture)

- **Other fields:** ~10~13 (covering the individualization 10)
  - science (~3, partially)
    - Math – 3 (equations of mathematical physics)
  - engineering (~10, partially)
    - Mechanical Engr. – 4~5 (principle of machinery & experiment)
    - Electrical Engr. – 5~6 (circuits & experiment)
    - Computer – 2~3 (computer interface)
    - Mechanics – 3 (elasticity & FEM)
  - Interface to courses: kernel in other disciplines & graduate level – 4
Philosophies

- Collision of ideas & creation

- Fostering interdisciplinary innovation
  - application #1: nationwide contests
    - ~5 million CNY invested each year
    - ~100 contests supported
  - application #2: research oriented projects
    - much larger group and more financial support

- Supporting entrepreneurship
Gains

- Academic experience
- Insights on theory vs. reality
- Better understanding of other fields
- Team work ability
- Broadened social network
Example-1

Lilac Nano-Satellite Group of HIT

- **History:** since 2012 (~6 years)
- **Size:** ~40 active members (undergraduates, MS & PhD graduates)
- **Sub-systems:** 8 in total
  1. general
  2. measurement & control
  3. attitude control
  4. power supply
  5. housekeeping
  6. telecommunication
  7. structural & thermal control
  8. testing, ground station
- **Disciplines involved** (>= 8)
  - aerospace & astronautics, mechanics, control engineering, computer science, mechanical engineering, telecommunication, electrical engineering, thermal power engineering, etc.
  - Others
LilacSat-1
(QB50, CubeSat 2017.4.8, ISS)
LilacSat-2
(2015.09.20, Long March-6)

The 1st satellite in China designed, developed & controlled all by students
Example-2

Aeromodelling Association of HIT

- **History:** since 1990 (~28 years)
- **Size:** 70~80 active members
- **Subgroups:**
  1. helicopters
  2. fixed wings
  3. rockets
- **Disciplines involved (>= 7)**
  - aerospace, mechanics
  - telecommunication, mechatronics, materials science
  - energy science, electrical engineering, etc.
AA-HIT on CADC
Thanks for listening!