

# Flourish Farms Aquaponics Business

## Course Syllabus

### Day 1

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<b>Water, Cycling and Bacteria</b>	<ul style="list-style-type: none"><li>• Water sources, testing, source water filtration, pH</li><li>• Cycling, Nitrification and Denitrification</li><li>• Ammonia, Nitrate, Nitrite</li><li>• Good and bad bacteria</li></ul>
<b>Fish</b>	<ul style="list-style-type: none"><li>• Fish inputs, outputs, species and characteristics</li><li>• Maintaining fish health – water quality, dissolved oxygen, feeding, FCR</li><li>• Fish transporting, acclimating, handling and stocking, quarantine</li><li>• Fish disease prevention and controls</li><li>• Purging, harvesting and breeding</li></ul>
<b>Plants</b>	<ul style="list-style-type: none"><li>• Plant growth in aquaponics and challenges</li><li>• Plant species, characteristics, vegetative, reproductive growth, pollination</li><li>• Plant needs – nutrients, light, temperature, pH</li><li>• Organic, conventional, 3<sup>rd</sup> party certifications</li><li>• Plant disease prevention and controls</li><li>• Integrated Pest Management</li></ul>
<b>At the Farm MHCD</b> <b>3445 Eudora, Denver 35<sup>th</sup> and Eudora</b>	<ul style="list-style-type: none"><li>• Tour of the Mental Health Center of Denver Greenhouse</li><li>• Community engagement, staff food box program, crops, VTF program</li><li>• Discussion of DWC, nursery system, elevated raft, decoupled systems</li><li>• Fish system, aeration, air lift, heater, plumbing</li><li>• Site considerations, greenhouse structure, controls</li></ul>

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### Day 2

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<b>Aquaponics Component Overview</b>	<ul style="list-style-type: none"><li>• Component Selection – tanks, filtration, pumps, aeration, heating</li><li>• Aquaponic Systems Types – Deep water culture, Media, NFT, Wicking Beds</li></ul>
<b>Aquaponic System Design</b>	<ul style="list-style-type: none"><li>• Space planning and layout considerations</li><li>• Feed ratios to fish and plant stocking densities</li><li>• System design principles – tank placement, filtration, aeration and lighting</li><li>• Coupled and decoupled water flow</li><li>• Nursery and transplant, media beds, wicking beds</li></ul>
<b>Financial Planning</b>	<ul style="list-style-type: none"><li>• Production and Revenue forecasting scenarios</li><li>• Startup and operating capital costs</li><li>• Profit and Loss Review</li><li>• Overview of financial forecasting tools and financial planning spreadsheets</li></ul>
<b>Hands On Build Session</b>	<ul style="list-style-type: none"><li>• Perform an installation of many common farm components</li><li>• Fish tank placement</li><li>• Filtration components</li></ul>
<b>GeoTech</b>	<ul style="list-style-type: none"><li>• Plumbing components</li><li>• DWC metal frame construction</li></ul>

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## Day 3

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### Site and Building Considerations

- Area and location, site selection, zoning
- Outdoor and indoor growing
- Greenhouse structures
- Glazing, insulation and floor materials
- Interior and exterior space planning
- Indoor growing, on-site cooler, building security

### Environmental Equipment, Monitoring and Controls

- Air quality considerations
- Heating and cooling and energy inputs, ventilation
- Greenhouse controls and management
- Data capture, operations calendar, emergencies
- Monitoring and backup equipment

### Food and Farm Safety

- Fish and Leafy greens safety opportunities in aquaponics and challenges
- Food safety Standards – FSMA, FDA Produce Safety,
- Food Facility Registration
- GAPs and HACCP standards
- Keeping your food and farm safe

### At the Farm GrowHaus

4751 York St, Denver

- Growhaus tour, community market, hydrofarm, non-profit mission
- Review of the aquaponic farm – tanks, filtration, water flow, aeration
- Plant systems, Deep water culture, NFT, nursery, wicking bed
- Seeding, transplanting, harvesting, food safety
- Pest management scouting and spray demonstration
- Water testing and nutrient adjustments

## Day 4

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### Marketing

- The P's of marketing
- Products and Services, Production
- Pricing and Promotion
- People, Proposition, Placement and Packaging
- Profit, Polyculture of revenue, managing expenses

### Business Planning

- Business planning resources
- Business structures, legal, accounting, insurance and taxes

### Personal Planning

- Hobby to Farm, Creating a Sustainable Business
- Personal Plan and Partners
- Common Success and Failure Points
- Eight Forms of Capital

### Open Forum Discussion

- Q & A session
  - Certificates of Completion issued
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